North Slope Borough Comprehensive Plan
2019 - 2039

Anaktuvuk Pass
Point Hope

Atqasuk
Point Lay

Kaktovik
Wainwright

Nuiqsut
Utqiagvik

Adopted by the North Slope Borough Assembly on March 5, 2019
Chapter photo credit: Chapter title page photos are from ShoreZone\textsuperscript{1} with the exception of Chapter 3, which was provided by ASRC.

Dear North Slope Borough Residents,

The North Slope Borough has a long history of planning for its future. The first North Slope Borough Comprehensive Plan was adopted in 1983; it was last updated in 2005 — fourteen years ago. The first borough plan and its subsequent update, serve as decisive milestones in local self-determination for development control of North Slope lands and resources. The 1983 comprehensive plan gave our relatively young regional government greater control in protecting the wildlife and subsistence activities on which we depend for our cultural and nutritional sustenance. The creation of that important document also led to the adoption of the subdivision and land management regulations in Titles 18 & 19 that remain the fundamental regulatory tools that we utilize for development decisions to protect our land and responsibly guide the development of our vast natural resources. The 2005 update allowed us to further articulate the needs and issues facing our communities with a renewed vision for the future and strategies to implement that vision. **Now we again have an updated plan** — one that continues to reflect the values of our residents while also identifying current issues and needs with a new strategy for the future.

Comprehensive plans focus on community development. They address compatibility issues between land use, natural resource management and preservation, identification and preservation of historically and culturally significant lands, and planning for infrastructure needs. They can also include issues and needs related to health, economic development, education, recreation, and housing. Most importantly, comprehensive plans provide a vision for the future with goals and implementation strategies to achieve that vision. Land regulations, capital plans, master plans, and issue-specific studies implement the vision and policies from a comprehensive plan. Our adopted village plans include many or all of these issues, as well as others pertinent to each community. Now that we have adopted village comprehensive plans for every community with the exception of Nuiqsut, which was postponed at the village leadership’s request, we will use the plans’ guidance coupled with the regional perspective provided in this plan to go forward into the future with a common vision.
The creation of this comprehensive plan involved significant community involvement and stakeholder input over the last fifteen months. The input and guidance provided by our residents serves as the plan’s backbone. Five workshops were held a year ago to identify the Borough’s Strengths, Weaknesses, Opportunities, and Threats (SWOT Analysis). This process was essential to develop this comprehensive plan’s contents and direction. The SWOT discussions assisted in creating a vision statement that represents what we want for the future in our region over the next two decades as an overarching guide for borough policies, programs, and development across the North Slope. The SWOT workshops also provided invaluable insight on the assets we need to build on, what challenges we need to deal with, and what opportunities we should capitalize on. The discussions and input from the SWOT workshops were collectively integrated into the plan so that it reflects the borough’s values, priorities, and culture. Borough staff also traveled to every village to seek additional input on the plan’s contents.

While times have changed, our Iñupiat culture and self-determination endures. Respect for elders, value for family and tradition, and subsistence continue to be integral to our daily lives. It is through our community spirit and regard for our Iñupiat values, we endeavor to build stronger synergies with all organizations that serve residents of the North Slope Borough: federal and state governments, ASRC, village corporations, local and Tribal governments, neighboring jurisdictions, and others. This plan is one tool that guides us in deciding our future and communicates to those outside the North Slope what we expect for our region and our people.

Quyanaqpak,

Mayor Harry K. Brower, Jr.
North Slope Borough
Comprehensive Plan
Adopted on March 5, 2019

North Slope Borough Assembly Ordinance #75-06-73
North Slope Borough Planning Commission Resolution #2019-01
NORTH SLOPE BOROUGH
COMPREHENSIVE PLAN 2019 — 2039

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The Comprehensive Planning Stakeholder Committee provided invaluable input on improving both the plan and the planning process. The Arctic Slope Native Association, Tagiugmiullu Nunamiullu Housing Authority, and Iļisaġvik College all provided important comments and corrections on the plan’s contents. Most importantly, North Slope community residents in every village deserve a special acknowledgement for contributing their time and direction for the contents of this plan during public meetings and with written comments.

The Planning Team thanks Dr. Edna Ahgeak MacLean for translating the vision statement and Beverly Hugo for translating the executive summary. Their contribution to this plan is greatly appreciated.
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<td>Alaska Native Tribal Health Consortium</td>
</tr>
<tr>
<td>ANWR</td>
<td>Arctic National Wildlife Refuge</td>
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<tr>
<td>APSC</td>
<td>Alyeska Pipeline Service Company</td>
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<tr>
<td>ARCO</td>
<td>Atlantic Richfield Company</td>
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<tr>
<td>ARDOR</td>
<td>Alaska Regional Development Organizations</td>
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<tr>
<td>AS</td>
<td>Alaska Statute</td>
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<tr>
<td>ASLA</td>
<td>Accelerated Second Language Acquisition</td>
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<tr>
<td>ASNA</td>
<td>Arctic Slope Native Association</td>
</tr>
<tr>
<td>ASRC</td>
<td>Arctic Slope Regional Corporation</td>
</tr>
<tr>
<td>ASTAC</td>
<td>Arctic Slope Telephone Association Cooperative</td>
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<tr>
<td>ASTAR</td>
<td>Arctic Strategic Transportation and Resources</td>
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<tr>
<td>ATV</td>
<td>All-Terrain Vehicle</td>
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<tr>
<td>AWIC</td>
<td>Arctic Women in Crisis</td>
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<td>BEES</td>
<td>Building Energy Efficiency Standard (AHFC)</td>
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<td>BEO</td>
<td>Barrow Environmental Observatory</td>
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<td>BFP</td>
<td>Belt Filter Press</td>
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<td>BIA</td>
<td>Bureau of Indian Affairs</td>
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<tr>
<td>BIF</td>
<td>Best Interest Findings</td>
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<tr>
<td>BLM</td>
<td>Bureau of Land Management</td>
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<tr>
<td>BOEM</td>
<td>Bureau of Ocean Energy Management</td>
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<tr>
<td>BP</td>
<td>British Petroleum</td>
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<tr>
<td>BTU</td>
<td>British Thermal Unit</td>
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<td>BUECI</td>
<td>Barrow Utilities and Electric Cooperative, Inc.</td>
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<td>C-Plan</td>
<td>Oil Discharge Prevention and Contingency Plan (also ODPCP)</td>
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<td>C&amp;D</td>
<td>Construction &amp; Demolition</td>
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<tr>
<td>CAA</td>
<td>Conflict Avoidance Agreement</td>
</tr>
<tr>
<td>CAFF</td>
<td>Conservation of Arctic Flora and Fauna</td>
</tr>
<tr>
<td>CCDF</td>
<td>Child Care Development Fund</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<td>--------------</td>
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<tr>
<td>CCHRC</td>
<td>Cold Climate Housing Research Center</td>
</tr>
<tr>
<td>CCP</td>
<td>Corridor Partnership Plan</td>
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<tr>
<td>CDR</td>
<td>Concept Design Reports</td>
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<td>CEDS</td>
<td>Comprehensive Economic Development Strategies</td>
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<td>CEU</td>
<td>Continuing Education Unit</td>
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<td>CFD</td>
<td>Cubic Feet per Day</td>
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<td>CFR</td>
<td>Code of Federal Regulations</td>
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<td>CHAP</td>
<td>Community Health Aide Program</td>
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<tr>
<td>CHP</td>
<td>Combined Heat and Power Systems</td>
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<tr>
<td>CIPM</td>
<td>NSB Capital Improvement Program Management</td>
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<tr>
<td>cm</td>
<td>Centimeter</td>
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<tr>
<td>CNG</td>
<td>Compressed Natural Gas</td>
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<tr>
<td>CPAI</td>
<td>ConocoPhillips Alaska, Inc.</td>
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<td>CPR</td>
<td>cardiopulmonary resuscitation</td>
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<td>CWAT</td>
<td>Community Winter Access Trails</td>
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<tr>
<td>CY</td>
<td>Cubic Yards</td>
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<td>CYS</td>
<td>Children &amp; Youth Services</td>
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<tr>
<td>CZMA</td>
<td>Coastal Zone Management Act</td>
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<tr>
<td>DARE</td>
<td>Drug Abuse Resistance Education</td>
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<tr>
<td>DBE</td>
<td>Disadvantaged Business Enterprise</td>
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<tr>
<td>DCED</td>
<td>State of Alaska Department of Commerce, Community, and Economic Development</td>
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<tr>
<td>DCRA</td>
<td>Division of Community and Regional Affairs</td>
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<td>DEW Line</td>
<td>Distant Early Warning Line</td>
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<tr>
<td>DLMW</td>
<td>Division of Mining, Land, and Water</td>
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<td>DNR</td>
<td>Alaska Department of Natural Resources</td>
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<td>DO&amp;G</td>
<td>Department of Oil and Gas</td>
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<tr>
<td>DOD</td>
<td>Department of Defense</td>
</tr>
<tr>
<td>DOT&amp;PF</td>
<td>Alaska Department of Transportation and Public Facilities</td>
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<tr>
<td>DPS</td>
<td>Distinct Population Segment</td>
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<tr>
<td>DR&amp;R</td>
<td>Dismantlement, removal and restoration</td>
</tr>
<tr>
<td>E&amp;P</td>
<td>Exploration and Production</td>
</tr>
<tr>
<td>EA</td>
<td>Environmental Assessment</td>
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<tr>
<td>EECBG</td>
<td>Energy Efficiency Block Grant</td>
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<tr>
<td>EEZ</td>
<td>Exclusive Economic Zone</td>
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<tr>
<td>EGIDS</td>
<td>Expanded Graded Intergenerational Disruption Scale</td>
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<tr>
<td>EIS</td>
<td>Environmental Impact Statement</td>
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<td>EPA</td>
<td>Environmental Protection Agency</td>
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<td>ESA</td>
<td>Endangered Species Act</td>
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<tr>
<td>EQ</td>
<td>Equalization</td>
</tr>
<tr>
<td>EWC</td>
<td>Eskimo Walrus Commission</td>
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<tr>
<td>FAST Act</td>
<td>Fixing America's Surface Transportation Act</td>
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<td>FHWA</td>
<td>Federal Highway Administration</td>
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<td>FLPMA</td>
<td>Federal Land Use Policy and Management Act</td>
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<td>FMR</td>
<td>Fair Market Rental</td>
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<td>FUDS</td>
<td>Formerly Used Defense Sites</td>
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<tr>
<td>FY</td>
<td>Fiscal Year</td>
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<td>GCI</td>
<td>General Communication, Inc.</td>
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<tr>
<td>GP</td>
<td>General Permit</td>
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<tr>
<td>GPD</td>
<td>Gallons per Day</td>
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<tr>
<td>GPS</td>
<td>Global Positioning System</td>
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<tr>
<td>HIA</td>
<td>Health Impact Assessment</td>
</tr>
<tr>
<td>HUD</td>
<td>United States Department of Housing and Urban Development</td>
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IBH  Integrated Behavioral Health
ICAS  Iñupiat Community of the Arctic Slope
ICC  Inuit Circumpolar Conference
IHBG  Indian Housing Block Grant
IHLC  Iñupiat History, Language and Culture Department
IHS  Indian Health Service
ILF  Iñupiaq Learning Framework
ILMA  Interagency Land Management Agreement
IRA  Indian Reorganization Act
IRR  Indian Reservation Roads
ISC  Ice Seal Committee
IWC  International Whaling Commission
JCAHO  Joint Commission on Accreditation of Healthcare Organizations
KIC  Kaktovik Iñupiat Corporation
kWh  Kilowatt Hour
LMR  Land Management Regulation
LNG  Liquefied Natural Gas
M&O  Maintenance and Operations
MBTA  Migratory Bird Treaty Act
mm  Millimeter
mmcfd  Million Cubic Feet per Day
MMPA  Marine Mammal Protection Act
MP  Milepost
MTFA  Medical Travel and Funeral Assistance
MYAC  Mayor’s Youth Advisory Council
NAHASDA Native American Housing Assistance and Self-Determination Act
NARL  Naval Arctic Research Laboratory
NEA  National Education Association
NEPA  National Environmental Policy Act
NGO  Non-governmental organizations
nm  Nautical Miles
NMFS  National Marine Fisheries Service
NNGP  Nuiqsut Natural Gas Pipeline
NOAA  National Oceanic and Atmospheric Administration
Non-RACM  Non-Regulated Asbestos Containing Material
NPR-A  National Petroleum Reserve – Alaska
NPS  National Park Service
NRHP  National Register of Historic Places
NSB  North Slope Borough
NSBMC  North Slope Borough Municipal Code
NSBSD  North Slope Borough School District
NSMP  North Slope Management Plan
NSSRR  North Slope Subsistence Rural Region
NVB  Native Village of Barrow
NVPH  Native Village of Point Hope
OC  Olgoonik Corporation
ODPCP  Oil Discharge Prevention and Contingency Plan (also C-Plan)
PAR  Project Analysis Report
PARS  Port Access Route Study
PCE  Power Cost Equalization
PET-4  Naval Petroleum Reserve No. 4
<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>PFD</td>
<td>Permanent Fund Dividend</td>
</tr>
<tr>
<td>PID</td>
<td>Public Interest Determination</td>
</tr>
<tr>
<td>PLB</td>
<td>Personal Locator Beacon</td>
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<tr>
<td>POP</td>
<td>Persistent Organic Pollutant</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal Protection Equipment</td>
</tr>
<tr>
<td>PRAC</td>
<td>Primary Response Action Coordinator</td>
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<tr>
<td>QIT</td>
<td>Quality Improvement Team</td>
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<tr>
<td>RDD</td>
<td>Resource Development District</td>
</tr>
<tr>
<td>RMP</td>
<td>Resource Management Plan</td>
</tr>
<tr>
<td>RO</td>
<td>Reverse Osmosis</td>
</tr>
<tr>
<td>ROD</td>
<td>Record of Decision</td>
</tr>
<tr>
<td>RV</td>
<td>Recreational Vehicle</td>
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<tr>
<td>SA-10</td>
<td>Service-Area 10</td>
</tr>
<tr>
<td>SBR</td>
<td>Sequencing Batch Reactors</td>
</tr>
<tr>
<td>SDMS</td>
<td>Spatial Data Management System</td>
</tr>
<tr>
<td>SHPO</td>
<td>State Historic Preservation Office</td>
</tr>
<tr>
<td>SnowTRAC</td>
<td>Snowmobile Trail Advisory Council</td>
</tr>
<tr>
<td>SNS</td>
<td>Sustainable Northern Shelter</td>
</tr>
<tr>
<td>SOWP</td>
<td>Solid Oily Waste Pit</td>
</tr>
<tr>
<td>SPCC</td>
<td>Spill Prevention, Control, and Countermeasure</td>
</tr>
<tr>
<td>SWOT</td>
<td>Strengths, Weaknesses, Opportunities and Threats Analysis</td>
</tr>
<tr>
<td>SWPPP</td>
<td>Stormwater Pollution Prevention Plan</td>
</tr>
<tr>
<td>SY</td>
<td>School Year</td>
</tr>
<tr>
<td>TAPS</td>
<td>Trans-Alaska Pipeline System</td>
</tr>
<tr>
<td>TCC</td>
<td>Tanana Chiefs Conference</td>
</tr>
<tr>
<td>TLUI</td>
<td>Traditional Land Use Inventory</td>
</tr>
<tr>
<td>TNHA</td>
<td>Tagiugmiullu Nunamiullu Housing Authority</td>
</tr>
<tr>
<td>TOS</td>
<td>Thermal Oxidation System</td>
</tr>
<tr>
<td>TTP</td>
<td>Tribal Transportation Program</td>
</tr>
<tr>
<td>UCAN</td>
<td>United Caribou Association of the Nunamiut</td>
</tr>
<tr>
<td>UG</td>
<td>Underground</td>
</tr>
<tr>
<td>UIC</td>
<td>Ukpéeġvik Iñupiat Corporation</td>
</tr>
<tr>
<td>USACE</td>
<td>United States Army Corps of Engineers</td>
</tr>
<tr>
<td>USAF</td>
<td>United States Air Force</td>
</tr>
<tr>
<td>USCG</td>
<td>United States Coast Guard</td>
</tr>
<tr>
<td>USDOE</td>
<td>United States Department of Energy</td>
</tr>
<tr>
<td>USDOT</td>
<td>United States Department of Transportation</td>
</tr>
<tr>
<td>USFWS</td>
<td>United States Fish and Wildlife Service</td>
</tr>
<tr>
<td>USGS</td>
<td>United States Geological Society</td>
</tr>
<tr>
<td>UV</td>
<td>Ultraviolet</td>
</tr>
<tr>
<td>VEEP</td>
<td>Village Energy Efficiency Program</td>
</tr>
<tr>
<td>VIVA</td>
<td>Visual Iñupiaq Language Assessment</td>
</tr>
<tr>
<td>WG</td>
<td>Western Arctic Caribou Herd Working Group</td>
</tr>
<tr>
<td>WIC</td>
<td>Women, Infant, and Children</td>
</tr>
<tr>
<td>WRF</td>
<td>Waste Reduction Facility</td>
</tr>
<tr>
<td>WWTP</td>
<td>Wastewater Treatment Plant</td>
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Executive Summary

This North Slope Borough Comprehensive Plan is a policy document that will help guide borough decision makers on a wide array of issues over the next twenty years. The overall goal of this plan is to add a borough-level perspective and planning direction that complements and strengthens local planning efforts. It will also provide guidance to the cities, Tribal, and Native village corporations that represent the region’s eight communities as well as state and federal governmental entities, the regional Native corporations, the oil and gas industry, as well as other community partners.

The North Slope Borough consists of eight communities: Anaqtuuvak Pass (Anaktuvuk Pass), Utqiagvik (Barrow), Atqasuk, Kali (Point Lay), Ulquniq (Wainwright), Nuiqsut (Nuiqsat), Qaaqtuqigvik, (Kaktovik), and Tikiqaq (Point Hope), as well as the industrial oil and gas industry center of Deadhorse and the Prudhoe Bay region. The North Slope’s communities working together make the North Slope Borough a culturally rich and exceptional place to live and work. Borough residents enjoy quality schools, public infrastructure, strong local and regional leadership, and cohesive communities.

The purpose of this summary is to provide a snapshot of the plan and provide guidance on where to look in the full plan for more detailed information and direction. This plan is a policy document; it helps to guide borough decision makers. The Comprehensive Plan, an overarching planning document, is one part of the overall planning process in the North Slope Borough.

THE COMPREHENSIVE PLAN

Comprehensive plans are designed to guide the future of a community or region. A comprehensive plan also contains a vision for the future coupled with background information that provides the foundation for long-range goals and objectives for activities that affect land use, its residents, government and development projects. More specifically, comprehensive plans are intended to guide the growth and development of the region; provide anticipated capital needs over a 20 year planning horizon; serve as the foundation to land use planning and regulations, infrastructure investments, and land use policy decisions. Where comprehensive plans are broadly written documents, the planning tools utilized to implement them are often specific and detailed.

A comprehensive plan and a zoning ordinance are two separate and distinct tools that are used in conjunction with one another. A comprehensive plan provides general guidance on how land should be used to meet the needs and desires of the community, whereas a zoning ordinance regulates specific land
uses and developments. Subdivision regulations, design guidelines, capital improvement plans, master plans, and area plans are also utilized to implement the comprehensive plan.

**PLAN DEVELOPMENT**

The North Slope Borough has a strong history of planning. The first borough comprehensive plan was adopted in 1983 and last updated in 2005. This 2019 comprehensive plan expands on numerous interrelated topics, such as public facilities, services, borough subsidies, as well as updated discussions on health, housing, subsistence and education, among others.

The 2019 comprehensive plan update began with replacing the individual community profiles with detailed comprehensive plans for each community that provide more in-depth information than previous versions, coupled with village specific goals, objectives, and implementing strategies to achieve each village’s vision for the future. The development of these plans focused on village resident input, perceptions, needs, and expectations gathered through public meetings and workshops as well as close coordination with each communities’ city council, Tribal council, and village corporation. What results are culturally sensitive current and future needs of the communities as expressed by the residents and village leadership.

This North Slope Borough Comprehensive Plan and the village specific plans are intended to complement each other. The goals, objectives, implementation strategies and relevant information should be consistent, where possible and defer to village plans for village-specific issues or concerns. The plans should not be viewed as hierarchical; rather, they are all pieces of one vision for the North Slope and should complement each other.

In 2015, a Quality Improvement Team was developed to oversee the comprehensive plan development process and provide strategies for its implementation. The team is comprised of one representative from each North Slope village with an Executive Committee that includes representatives from the North Slope Borough Mayor’s Office, the NSB Planning and Community Services Department Director and Deputy Director, and leadership from both the regional Native Corporation (Arctic Slope Regional Corporation) and the Utqiaġvik Village Corporation (Ukpeaġvik Inupiat Corporation). The team meets quarterly to collaboratively overcome challenges, improve the planning process, increase community awareness and involvement, and continuously improve the quality of plans and consultant performance on the contract. The team also provides an annual update to the NSB Assembly. The Assembly also provide guidance continually for developing the overall plan, as well as viable alternatives to content, format, and the goals, objectives, and strategies to implement the plan.

Public input was sought continuously during plan development. North Slope Borough staff and its consultants held five Strengths, Weaknesses, Opportunities, and Threats (SWOT) workshops early in the planning process. Participants included borough department directors, deputy directors, program
managers, and community service providers. Community meetings were also held in each of the eight villages to inform and educate the residents about the planning process and seek input in developing the plan. After the draft Comprehensive Plan was completed and disseminated, there was a five week public comment period, from November 20 through December 28, 2018.

**VISION STATEMENT**

North Slope Borough government provides quality infrastructure and public services while developing trusting, collaborative relationships with diverse partners. The borough is proactive in protecting and promoting subsistence and cultural activities, enhancing health and safety, protecting the environment, and providing cultural, recreational, and economic opportunities while focusing on the region’s self-determination, sense of community, and Iñupiat values. These values are captured in the Comprehensive Plan’s vision statement for the next twenty years and beyond:

*With a strong sense of self determination and the guiding principle of “maximum local government” guaranteed by our State Constitution, we will rediscover our founder’s vision for this Home Rule Borough.*

*We will continue to embrace and value a strong sense of community through an active subsistence lifestyle that respects traditional wisdom and Iñupiat Values, while we welcome new technological advancements and contemporary knowledge.*

*We will guide regional development in a coordinated, cost effective, efficient, and environmentally responsible manner.*

*We will lift up and celebrate each community’s historical significance, wildlife habitats, clean air and water, and be responsible stewards of our abundant natural resources.*

*We will endeavor to improve transportation systems and connectivity between villages and the rest of the State for the economic benefit of our residents.*

*We must invest in and maintain reliable utilities, public infrastructure and community facilities in order to ensure quality essential services to all residents for perpetuity.*

*There must be quality affordable rental and home ownership opportunities and upgrades to existing homes for all income levels to alleviate overcrowding and improve living conditions in this region. The Borough accepts a leadership role in providing solutions.*

*Our education systems will prepare our youth and adults through training opportunities and programs tailored to meet the employment needs of this region first.*
Our government will promote healthy lifestyles, recognize service to community and inspire our children and adults to be thoughtful and well-informed and accept the responsibility for our future.

We will strive for unity through more transparency in government, more education on the issues important to our region. We will participate as individuals; listening and communicating; engaging our youth and our elders; plan for our future and adapt to change when we need to, together.

**PLAN STRUCTURE**

The NSB Comprehensive Plan includes sixteen chapters with accompanying tables, charts, and maps. The Plan is divided into three parts. **Part I: North Slope Borough Culture and Planning** includes the first three chapters that provide a foundation to the remainder of the plan. Chapter one provides a history of the North Slope region, a discussion of Iñupiaq values, culture and language, information on the NSB budget and the variety of entities that play a role in governance of the North Slope. Chapter Two includes an overview of planning on the North Slope and the comprehensive planning process. Chapter Three provides the vision statement in English and Iñupiaq.

**Part II: The North Slope Borough Today** contains the next twelve chapters. These chapters focus on variety of topics including: demographics; the natural environment; subsistence; public facilities and transportation; energy; housing; education; economy and economic development; health and safety; and land use and land management. Each of the chapters are generally laid out with an introduction, background, and inventory of current conditions. They each conclude with a summary of community input; findings, needs and challenges; and applicable goals, objectives, and implementing strategies.

The final chapter, Plan Implementation is found in **Part III: North Slope Goals**. This chapter identifies 13 goals, associated objectives and implementation strategies. Goals are broad statements that describe long-term desired outcomes. Objectives are measurable steps to achieve a goal. Implementation strategies describe specific steps to reach an objective or goal.
QaukJim Kiluktuuta


Tamna kiluqtuun manirirauruaq kiniğatun ilisaglugi ilivsinnun sivunniuqun suakiaq aullatiniagaasi sivunniuguvsi qiniqsimaalulgu naamaruñq sivunniugun. Tamna NSB naasaaglu sivunniugutaat aullatiniagaatigut.

Naasaaglu Sivunniuqun


Naasaaglu sivunniuqunnuq suli piraksriutit qanuqiaq ittuqtat tapkuuk allaqilarluk savalguktukaluq atuumasuaqgaic ilaani iviqtitchaglugik. Suli naluniqsimmarunq qanuq nuna atuñnaq piraksriutit akuqtuqgalguq pigiragsranjich naagga piqisukqalluaqtañanin Nunaaqim, aglaanguq piraksriutit maliquaqtuqsgaraic qanuqiaq nuna atuñniagmagaan naagga sunik savaagsriugniqpattun. Nunam nunaurranjich ilaaniñjarutuñq, naagga qinñaksraq maliguagrasñq, naagga savaaqugsaic ilaaniñjarutuñq atuumaqgaruñq.

Sivunniutum Savaaqinianjich

panamapak 2019-mi naasaaglu sivunniuqñun taputsaaglu qavsisallañin ilagiiktaunik ilavsaanarut iñuich pisigivlu ikayuutaurruanik iñuuniaqtaunik nunaaqqillaani nappaivilutitik sayaaaninnikulu igluqpinikunlu anuniiqminunlu, iñsaurrinikunlu.


NSB naasaaglu sivunniuqñun suli nunaaqqillaam sivunniugutipiñjillu illuautugsiarrut avanmun. Tikisaagrsrat, manirrinatqallu, suli ganaq qaanaqqañtiruñjilu savaqisagluglu nunaqqim naasaaglu sivunnuqíñja suli nallautikchaglu NSB sivunnialanun.


QIÑIQTUURAM UQALUATA

NSB-gavamapta inillajñaruñq nakuurualuktaunik inniqpañqñgstuñ iñuñjillu savaqitugluglitch sunik ukpiñqañtukatun, savaqatigiqqiniñunlu avanmun allaniglu pañañaqigkixlutin. Borough-guq paammarlaagiññi qaunagivluglillu, açunuñqñic sivulligjñlu suli ñupiñaguniquñput tunullimaqsiqgluglitch sayaaqgiññiqpullu piyaqqtulaakunlu iñuunianiq, suli nunapaqput
qaunnagiluaatignialu suli qitiktauviŋŋiqglu qanuq maninnagniaq-niglu piviksrat isummatigivlu Inupiat sivunmuutat piutaat, suli nunaaqqiunim, suli Inupiat Piqpagikanjññ Atuuumavlugichlu uvlutuaq. Tapkua piqpagiravut inillagiuugivut naasaaglu sivumiuniqutipiitññ Inuinaq ukiutun paŋmapakmunlu taimuçalu.

Ilitchuqilluataŋavlugu payaŋatchuakun nanmiñikuaŋqiq sivunniuŋqiptinni, suli ilitchuqilluataŋavlugu “suŋaranakun Nammiñiq kavamauñiq” nappaŋutiaqtaqtaq State Constitution-kun, ilitchuqitqiqniŋiŋqigkput siviulliqta tikisasriñañat uumuuna Home Rule Borough-kun.

Nunaaqqiqatigiŋiqŋiqput suŋaranuq sivunmun igliŋutiniŋqikput arunjiaŋqiptigun qiksiqilugit taimanŋa-qañuq isumattutivut suli Inupiaqavlugu piqpagiravut, akuqtuqiaŋillaisa nutaat savalqituti suli pagmapak ilitchuqianiktavut.

Igliŋutiniŋqigkput nauniña nunapta avanmun savaqatigiŋigluta, maniksuguniq qaunagiluglu, suli maqurrutauniqtiŋchuuakun nunamun.

Qutchiŋiniŋqigvut suli quviasuutigilugit nunaaqqiļaam taimanŋa-qañuq nuimaraŋqiraniŋñu, niŋrutinisa iniqini, salumaruniq sijaqgaŋqiq suli salumaruniq imaŋtaiqviŋaŋqiq, suli qaunagilluataŋqiglugit iŋugiaqtuat nunapta umialqutiqiññu.

Igliŋqinvut suli qaŋasaurakun atautchimiirrutivut nunaaqqiļaaptinniññu allanun iniqini State-mi, nutaqsaŋqiŋqigvut anniqsuutaqaŋqiglugit iŋuuniŋaŋqiniŋñiññi iñuiq nunaptinni.

Manniqsuksraqigvut suli qaunagilluataŋqitsraqgigvut taimuña atuqumiŋaŋqisalugigqut anniqsuutaŋqirat iŋuuniŋaŋqiptinni tapuqilugit nappaŋaŋratiq suraŋqviññi nunaaqqiļaaptinni.

Iglulluataŋqitsraŋqisalugigqut nutaanik atuqumiŋaŋqitsraŋqpiññq akiliļaŋqilugit tatqiŋ tikillaŋapun naaqa iłuqan akiliļiŋqilugit nanmiñiq pิgiliiŋqilugigqut; suli nutaksaufiqtsraŋqitsraŋqilugigqut napaŋkutianun IGHLUNUN QANUTUPAYAAQ akiŋñaqtaŋqiŋqugalanapun iŋuk, iŋugiaŋqiŋñiq iglimi palaŋŋaktaŋqisalugiglugi nunaptinni. Borough-m aqtuqiuqigaagaa taaptumuuna savaaksraq.

Illisaqvgiñqitaŋqanaiqautiniŋñiq nutaŋaŋñuŋq qatqiŋŋarullu illisaqtuwaŋqviŋgïq suli itqanainq slipped iila¼uaisranik tuŋaŋqilugiglugi savaannagniqu maanin.

Kavamapta sivunmuktaŋgïqeriq anniqsuutaŋqiuqun timiptignun iŋuuniŋaŋqiq, nangagaŋŋagai anniqsuutaŋqirat nunaaqqiññi, suli kiŋiŋruŋaŋŋagai nutaŋaŋñu
qatqiñaruallu isumalaaqulugi suli iñitchuñuluattaqulugi suli aukuqtuullaataqlugu qanuq igiñiañiqukkiraña iñuuñiaqripitu taimunña.

Atautchikuñaqruñxtugut kavamaptiguun sunapayaaq iliñtuaq ilísimapqaqtuglugu iñupayaamun, uqausígillluaqutuglugu suqutaurut suli nuimanaqtuut nunaptinni. Iñullaaguluta piqatauniaxtugut, naaļaŋniluta aasii uqataqtiigluguta, taputilugut nutagqallu utuqqanaallu; aasii sivunniuniqtiigluguta iñuuñiaqviksraptigun, suna allañuqtuulsivek engineer allañuqtaalugutu savaqatiigluta.

SIVUNNIŲŇUTIM İNILLANANIŇA


Tuglia NSB paŋmapakqulit alqaqunniq avgutiqaqtuq. Avgutit manirut allaqilaaruanik taputilugich ukkua: kitkununq iñuqaqtañqanunq nunaasqillaami, qanuqitilaañqunq iñuuńiaqvium irrusilañqunq; aŋnuqiañquñunlu; iñluqpaich iñuq atuqguðrranqunq; usiaiqsiqiñvullu ikuummatigrrallu; iñluquniñunlu; iñsaurriñunlu, maninañnaŋqinngiŋunlu; ikayuutauyuminaŋqtuunlu savaaśrrallu; sayaaiqiqinunlu; piyaqqutainnunlu; qanuoğlu nunaauratigun atugqiuqtañqanunq iglu suli qanuoğ atannqisimanaqtiqtañqanunq. Avgumlaa inilañeçaqqauchenqillu; kitkuutilaannyqinuniq, suli qanuqtun suqatqillaaminnik paŋmapak. Nunaasqillaat aŋqisaaqutiqqanqiuqtaŋqunq nunaaiqiqsia iñuqarut; sutlu qaqtichirañqnik suli piqiragsranqillu suli paqqaktuqtiqillu; suli tikisaurautiqqillu, savaagsrautiqillu, suli qanuoğ savaqgañaqpatigillu.

Part I: North Slope Borough Culture and Planning
Chapter One
History, Culture, and Government
Chapter 1. History, Culture, and Government

NORTH SLOPE HISTORY

The Iñupiat of the North Slope have a rich cultural history that is evident in both the living traditions and numerous archaeological sites on the North Slope. Some villages on the North Slope have been occupied continuously for thousands of years, such as Point Hope, while others were more recently founded as year-round village sites, such as Atqasuk. However, all of the land on the North Slope is rich with history and culture evidenced by abundant archeological sites across the entirety of the borough’s frozen tundra. An unadopted North Slope Borough Comprehensive Plan from 1993 provides a concise history of the North Slope and is presented in this section with minor changes for clarity.2

Despite its relatively severe environment, the North Slope area has long been attractive for human habitation, resulting in an extended archaeological record. The continuance of a culturally distinct population into historic and modern times prompted early ethnographic interest, accompanied by archaeological investigations. Archaeological sites have been recorded by individual researchers, by state and federally-sponsored agencies, and by the North Slope Borough. These archaeological sites document human activities over an exceptional period of time.

Discoveries in 1992 at the Mesa Site, 150 miles north of the Arctic Circle, have been dated at 11,700 years old. This is the oldest well-documented human habitation of North America. Scientists theorize that the Mesa Site was a lookout point for hunters who may have been in search of game that is now extinct, such as bison or even mammoth. Since there is no evidence of later cultures using the site, archaeologists have named this culture the Mesa Culture. The style of weapons found suggest the Mesa Site was used by a Paleo-Indian culture, of which no convincing evidence has been found elsewhere in Alaska prior to this discovery. Much remains to be learned about this discovery and about the people who hunted in this area thousands of years ago.

In approximately 5,000 B.C., peoples known archaeologically as the Denbigh Flint Complex inhabited the beaches of northwestern Alaska. Their technology included the microblade technique for producing long sharp slender slivers of stone, which indicates a cultural origin in Asia.

The Denbigh culture has been viewed as the beginning of the Arctic Small Tool Tradition, which lasted for several thousand years.

Mesa Archeological Site

Following several hundred years of gradual cultural dormancy, during which at least one completely alien Asiatic group known as the Old Whaling Culture briefly inhabited the Alaskan coast, the Arctic Small Tool Tradition was rejuvenated in the form of the Charis Culture. Changes in tool styles mark the evolution of the several succeeding cultural groups, the Choris, Norton, and Ipiutak Peoples. All shared in a basic lifeway which emphasized coastal settlement and subsistence and included pottery, and all are considered participants in the broad Arctic Small Tool Tradition. Sites relating to the tradition are dated as late as A.D. 500-700 in the Point Hope area and elsewhere.

A technological shift from chipped stone tools to ground slate tools was made by the Old Bering Sea Culture, who developed a more efficient coastal economy through the use of such items as skin floats for tiring harpooned sea mammals, and toggle harpoons. Whaling became a dominant force in the succeeding Birnirk and Thule Cultures - the ancestors of the Iñupiat. The archaeological record also indicates some seasonal emphasis on inland resources, particularly caribou, suggesting a regular pattern of inland and coastal exploitation. This lifestyle continued relatively unchanged until approximately 1875, when the local economies were significantly altered by a combination of several interrelated factors, including European contact and the introduction of metal tools, traps, and guns to support and intensify fur trade; a reduction in human population due to disease, famine, and warfare; and a reduction in the numbers of whales.

Following the initial voyages of Vitus Bering in 1728 and 1741, Russian adventurers and fur traders explored the Aleutian Islands, Kodiak Island, and southeastern Alaska, leading to the establishment of several settlements by 1800.

In 1778, Capt. James Cook voyaged as far north as Icy Cape. Russian penetration north into the area is not documented until M. N. Vasilev’s 1820 expedition, which turned back at a point 35 miles north of Icy Cape. Several parties independently charted the northern coastline in the following years through the efforts of Beechey and Franklin in 1826, Simpson in 1837, and Kashevarov in 1838. Between 1847 and 1853 several voyages were conducted along the Arctic coast, including those by Franklin, Pullen, and Maguire.
The overall impact of these intrusions on the Iñupiat inhabitants were slight and the Iñupiat continued to carry on their Asian trade across the Bering Strait while Russian trading posts were operating from Norton Sound southward. The expeditions did provide a wealth of geographic and economic information which stimulated future contact in the form of commercial whaling vessels. As commercial whaling stocks declined in the southern Pacific, whalers expanded northward to take advantage of the known resources in the Bering Sea. Commercial whaling in the Arctic grew rapidly from 1850, beginning with the discovery of bowhead migration routes and development of more efficient whaling techniques. The bowhead was originally sought for its oil, but the development of the petroleum industry in the 1860s reduced that demand. To compensate for falling prices, more whales were harvested and walruses began to be hunted as another source of oil (and ivory). Probably the most important of all developments during this time was the establishment of shore-based whaling stations beginning with the Pacific Stearn Whaling Company in 1884. Additional stations quickly sprang up at various sites along the Arctic coast including a large one at Jabbertown near Point Hope in 1887. These stations engaged in baleen trade with the Iñupiat. Commercial crews adopted Iñupiat techniques and Iñupiat crews were hired by the stations.

The operation of the shore stations were very effective in increasing the catch of bowheads, until shortly after the turn of the century. The end of commercial whaling came as new materials replaced the need for the expensive baleen, and with declining whale populations. By 1914, the stations had nearly all switched their emphasis from baleen to furs or had ceased operation. The severe decline of the bowhead was only one of several significant impacts of commercial whaling. The crews of the over-wintering ships and shore stations required large amounts of caribou. The reduction of the Western Arctic caribou herd in the latter part of the last century is attributed by some historians to extreme hunting pressure and a natural decline that began some years before. This decrease may have resulted in the death of a substantial number of inland Iñupiat (Nunamiut) whose primary resource was caribou. As the caribou herds
declined in the central Brooks Range, the Nunamiut then came to the coast where they hunted caribou for the whalers and engaged in fur trapping.

Mass death also resulted from foreign diseases when the Nunamiut came in contact with whalers during their annual trading fairs at the coast. The coastal Iñupiat were devastated by Measles and influenza. Prolonged contact with wintering crews also resulted in the spread of venereal disease. It was not until the 1920s, when the Presbyterian mission doctors and hospital introduced Western medical care to the region, that the Iñupiat population was able to begin recovery from the devastation of these introduced diseases.

Toward the end of the commercial whaling era, the fur trapping industry began to develop in the Arctic. In the early part of this century fur prices, especially white fox, began to rise and trapping replaced contract hunting as a source of employment for obtaining necessary trade items. At first, trapping was accomplished out of the villages. Eventually lines were extended inland and seaward. Population shifts occurred as families settled in uninhabited areas. The area east of Barrow towards Herschel Island was populated by two or three families in 1900, but by 1914 trapping camps were established at intervals all the way from Barrow to Harrison Bay. Smaller coastal settlements with trading posts to serve the trappers replaced the larger whaling settlements.

Although trapping took more time away from subsistence activities than did commercial whaling, it also forced a wider hunting area to be used by the trapper and opened up an alternative resource at a critical time. However, traditional social relations were affected by trapping. Trapping required time away from the village and family, and was an individual enterprise, which contrasted with the usual cooperative hunting pattern.

Along with the growth of the fur industry, missionaries began to influence Iñupiat culture. Dr. Sheldon Jackson, later a missionary and general agent of the Presbyterian Church for education in Alaska, was urged by a commander of one of the revenue cutters who patrolled Alaskan waters to provide for the “desperate condition of the Eskimos”. In response, the Federal Council of Churches
assigned most of the Arctic region to the Presbyterians in the 1890s, except Point Hope which was assigned to the Episcopalians.

The first Presbyterian missionary and teacher, L.M. Stevenson, was sent to Barrow in 1890. The first mission house (manse) was built in 1894 and the Presbyterian Church in Barrow was formally organized by Reverend H.R. Marsh in 1899. The missionaries disrupted traditional cultural practices and beliefs including housing, social interactions, settlement and subsistence patterns through practices such as prohibiting hunting on Sundays. However, the Presbyterian Church became an important part of the culture of the villages. In 1934, Percy Ipalook was the first of several Iñupiat to be ordained into the Presbyterian ministry. Many more Iñupiat were church deacons and active participants in church activities. Reverend Roy Ahmaogak, who was ordained in 1946, translated the New Testament into the Iñupiat language in the mid-1960s. Prior to that time, Iñupiaq had not been a formal written language. In 1970, Reverend Samuel Simmonds became the first Iñupiat minister to serve as pastor of the Barrow congregation.

The first school was constructed in 1894 in Barrow, when the U.S. Government took over education from the church. In the 1930s, the Bureau of Indian Affairs (BIA) assumed responsibility for Native education. Over the years there were many Iñupiat who became teachers and worked at the school. In 1975, the BIA turned over the responsibility for education to the North Slope Borough.

The introduction of missions and schools affected the traditional Iñupiat settlement patterns more than the previous economic phases. In their desire to educate their children and be near the missions and employment, the Iñupiat had to spend long periods of time in a central location. These locations, along the coast, became focal points for the Iñupiat settlements. As changing economic conditions warranted, the schools and trading posts opened, closed or moved along with the villages.

Sheldon Jackson, through various government agencies, attempted to introduce reindeer herding in Alaska in the 1890s as a replacement for serious resource shortages (caribou and whale) and to provide a new economic base. Initially, reindeer were individually owned, but the property marks soon were difficult to distinguish and a new system of joint ownership was introduced with shares in a company representing the reindeer. In 1933, open herding was introduced and close supervision of the reindeer decreased. Herds developed throughout the Arctic coast at Point Hope, Point Lay-Icy Cape, Wainwright and Barrow, and by the late 1930s at Cape Halkett, Colville River mouth, Beechey Point, Barter Island and later at Collinson Point.

At the turn of the century, reindeer herds at Wainwright numbered about 2,300; in 1918 they had grown to 22,000 in Wainwright and 40,000 in Barrow. In 1940, Barrow’s herd was down to 5,000 and by the late 1940s to early 1950s, no herds remained in the Arctic. A combination of events, including mismanagement, predation and social tradition led to the decline.

After a bleak period in the 1930s, the economic picture improved during World War II for the country and for the Arctic region. Native craft sales increased due to the influx of military personnel. Mineral exploration programs within the Naval Petroleum Reserve #4 (PET 4),
established by President Warren G. Harding in 1923 began and in 1946, Iñupiat were hired as laborers with a flexible schedule that allowed for subsistence hunting.

Other construction projects such as the Naval Arctic Research Laboratory (NARL) near Barrow in 1947 and the DEW line defense sites in the early 1950s, provided other seasonal employment for the Iñupiat. A period of depression followed the military construction programs in which the traditional Iñupiat socioeconomic system reemerged as the primary economic system.

The contemporary period of political and economic development began in the 1960s with the regional organization of Iñupiat political groups in response to rapid change that threatened Native land rights through land transfers, biological resource limitations, and natural resource leasing. Events, such as the plan by the federal government to create a harbor at Cape Thompson with a series of nuclear detonations (Project Chariot), Barrow's concerns over Eider duck hunting restrictions (the 1961 Duck-In), the Iñupiat Paitot (People's Heritage) conference in Barrow in 1961, and formation of the Tundra Times in 1962, culminated ten years later with the passage of the Alaska Native Claims Settlement Act (ANCSA) of 1971.

The North Slope Native Association (later named Arctic Slope Native Association (ASNA)) developed as a result of an earlier Iñupiat conference (to later become the Alaska Federation of Natives (AFN) with the aim of resolving Iñupiat land claims). In 1965 under the leadership of Eben Hopson, Sr. as its first Executive Director, ASNA filed a land claim with the U.S. Department of the Interior for 58 million acres of Alaska’s arctic. Native groups filed claims totaling 172 million acres, about one-fourth of which the state had also selected. In 1966, Secretary of the Interior Stewart Udall put a moratorium on all land transfers to the state in response to these suits brought by ASNA until the Native claims were settled.

ASNA, now under the leadership of Joseph Upicksoun, withdraws from the Alaska

Eben Hopson, Sr.
Iñupiat Leader and Special Assistant to Alaska Governor Allen Egan

...The desire for self-determination on the part of the people who wish to exercise that right should not be denied by those that govern. I think every opportunity should be afforded the people who wish to initiate and suffer the hardships of self-determination through a more expanded local government...

In a letter to the local ASNA Chairmen of Point Hope, Wainwright, Barter Island, Anaktuvuk Pass, and Barrow, dated January 16, 19703

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Federation of Natives because proposed legislation to settle land claims would distribute land and money based on population. ASNA rejoins AFN when a compromise is reached. The largest regions would receive the most land and money, regardless of population. The compromise also includes a clause that a percentage of revenue generated by each region will be shared with the rest of the regions.4, 5

To settle Alaska Native land claims, Congress proposed the regional corporation concept and ASNA’s focus then became securing the land and cash settlements required to compensate the Iñupiat for the loss of original lands. When it became apparent that the proposed settlements would leave ASNA without valuable resources such as Prudhoe Bay, ASNA began to explore another option - creation of a borough under Alaska state law.

The passage of ANSCA was accomplished through association with the statewide Native organization, Alaska Federation of Natives, and with the support of the oil companies who realized the claims had to be settled before their work, and that of the state's selection and lease programs, could proceed.

The Presbyterian Church had been an important facet of North Slope life since the 1890s. Through many contacts within the national church hierarchy, the Presbyterians of ASNA obtained funding to aid in development of the borough. This form of government would give the Iñupiat powers of taxation to provide revenues, responsibility for education within the borough, and zoning powers to protect subsistence and cultural resources.

Despite strong opposition, the petition to create the borough was accepted by the state’s Local Boundary Commission in February 1972. In June 1972, voters of the North Slope communities overwhelming vote to approve the creation of the North Slope Borough. Later that month, the Alaska Supreme Court hears the case opposing the formation of the North Slope Borough and rules in favor of its creation, having found no merit in the oil industry’s arguments against allowing control of the land by the Native people of Alaska’s arctic.9 The North Slope Borough was

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6 In 1976, Congress enacted the Naval Petroleum Reserves Production Act, which redesignated Pet 4 as the “National Petroleum Reserve in Alaska” and transferred jurisdiction of it from the Navy to the Department of Interior.
incorporated on July 2, 1972 as a First Class Borough. A Home Rule Charter was adopted in 1974. The Alaska Supreme Court affirmed the borough’s ability to tax, but the Alaska State Legislature established a per capita ceiling on the borough’s taxing authority.

The Arctic Slope Regional Corporation (ASRC) began in 1972 as a profit-making corporation mandated under ANCSA to manage its 5.6 million acres and $36 million for benefit of the approximately 3,900 Iñupiat shareholders at the time of its establishment. While ASRC’s boundaries are essentially the same as the borough’s, land entitlement was limited to areas outside of conveyed lands or withdrawals such as the NPR-A and the Arctic National Wildlife Refuge (ANWR).

Village corporations were also created through ANCSA, allowing villages to select their village surface entitlements from federal withdrawals. This provision also allowed for the re-establishment of Nuiqsut and Atqasuk, traditional villages that had not been populated in recent years due to emigration to larger villages.

International challenges were met through the organization of the Iñuit Circumpolar Conference (ICC) in 1977, where delegates from Canada, Greenland, and Alaska met with the idea to develop an international policy on Arctic conservation and environmental protection, especially of offshore resources. The ICC now includes Iñuit from Russia. Also in 1977, the International Whaling Commission (IWC) voted to cancel the right of Native people to take bowhead whales. Whaling captains from nine communities created the Alaska Eskimo Whaling Commission (AEWC) to respond to the ban, and eventually a limited quota was agreed upon. In later years, the quota has steadily been increased with cooperative agreements with the federal government.

The Alaska National Interest Lands Conservation Act (ANCILA) was passed in December of 1980 after several years or congressional debate. In the act were items of critical importance to North Slope Iñupiat, including the creation of Gates of the Arctic National Park and Preserve, and additions to ANWR. Other sections of the act allow Arctic Slope Regional Corporation to exchange lands within the region, grant future pipeline rights-of-way across certain public lands and allow future subsurface title to village corporation lands within NPR-A and ANWR.

Public Law 98-366, known as the Barrow Gas Field Transfer Act of 1984, was signed into law June 17, 1984. This act responded to a federal obligation to supply energy to villages of the North Slope that was becoming too costly to continue. The act filled a need to provide a steady energy supply to villagers and federal facilities in the Barrow area. The significance of this legislation is worth note for a number of reasons, including

- Subsurface estate to the Barrow and Walakpa gas fields and their related support facilities were conveyed to the NSB, along with the right to continue to explore for, develop and produce gas for local use.

- Additional lands at Cape Simpson and Drenchwater Creek were also conveyed to the NSB under the assumption that they would assist in generating operational funding for the gas fields.
• Ukpeagvik Iñupiat Corporation (UIC) and ASRC were granted alternative land selection and gravel rights in exchange for their interests in the Barrow/Walakpa gas fields.

• The act provided the right of the NSB to exploit gas and entrained liquid hydrocarbons from federal test wells in the NPR-A for local village utility uses from lands included within terminated, expired or surrendered federal onshore oil and gas leases with NPR-A. It also included leased areas, with the consent of lessee and under mutually agreeable terms and conditions, to exploit and use gas and entrained liquid hydrocarbons from non-producing wells capable of production, including capped wells, in federal oil and gas leases within the NPR-A.

• The North Slope Borough agreed to accept responsibility for the operations and maintenance of the gas fields.

A Coastal Zone Management Plan for the North Slope Borough was begun in the late 1970s and finally adopted in 1988 as part of the State of Alaska and National Coastal Management programs under the Coastal Zone Management Act (CZMA). In 2011, the state withdrew from the national program. All NSB provisions in the Alaska Coastal Zone Management Program are retain in NSBMC Title 19 but without the state plan, implementation became much more limited.

The State of Alaska In 1982, the borough adopted its first comprehensive plan. The Comprehensive Plan and Land Management Regulations adopted are the primary North Slope Borough regulatory tools, which ensure the borough’s rights to control development in coastal areas to protect marine life critical to the subsistence lifestyle of the Iñupiat as well as to protect subsistence and cultural resources on land. Most development requires a permit granted on the basis of comprehensive plan policies which discourage or prohibit negative impacts of development and encourage positive impacts, such as local employment.

During the 1980s, the borough initiated a major capital improvements program. Millions of dollars were spent on projects to improve housing, schools, sewer and water facilities, roads, airfields, and health facilities. These projects were designed to improve living conditions for borough residents, and to provide training and employment for the shorter term construction projects as well as for the longer term in operation and maintenance of public facilities in the borough. Ordinance 93-10 contained major funding to bring piped water and sewer systems to all North Slope Borough communities before the end of the decade. Each community now has a water and sewer system, in addition to other public building and facilities.

**Historic and Cultural Resources**

Because the North Slope has been inhabited for thousands of years, cultural heritage sites are scattered across the region. Tools, household items, artwork, and dwellings are just some of the artifacts found on the North Slope.

Culturally important sites are compiled locally and at both the state and federal level. Locally, the North Slope Borough tracks important historic or cultural resource sites in the Traditional Land Use Inventory (TLUI). There are currently 1609 culturally significant sites in the
The Alaska Department of Natural Resources, Office of History and Archaeology, maintains the Alaska Heritage Resource Survey (AHRS), with detailed information regarding cultural resources throughout the state. AHRS has 5,048 documented sites within the North Slope Borough. These databases are voluminous, with detailed information on historic and contemporary traditional use areas.

In addition to local and state databases, the United States government has two notable programs that acknowledge and seek protection for areas and structures of national historic significance: National Historic Landmarks and the National Register of Historic Places. National Historic Landmarks are a subset of the National Register of Historic Places and are considered to have exceptional national significance quality in illustrating or interpreting the heritage of the United States. Both programs are administered by the National Park Service. Properties are designated by the Secretary of the Interior. Currently, there are just over 2,500 historic places with this national distinction, fifty of which are in the state of Alaska and four within the North Slope Borough. The National Register of Historic Places is an inventory of properties that have been determined to be worthy of preservation based on historic or cultural significance. The National Register of Historic Places is one effort by the National Park Service to coordinate and support preservation of historic and archeological resources. Within the North Slope, there are 18 buildings or other structures, sites, and archeological districts that are on the National Register of Historic Places. Although both of these databases contain significant number of sites, a complete survey of the borough’s cultural resources has not been conducted; there are undoubtedly hundreds or thousands of culturally significant sites that have yet to be located. For detailed information on archaeological, historical, and traditional land uses, the North Slope Borough and Alaska Office of History and Archeology should be consulted.

Section 106 of the National Historic Preservation Act requires federal agencies to consider the effects of a project that utilizes federal funding, involves federal authorization, or are on federally managed land. It may also require a cultural resources survey. The North Slope Borough Planning and Community Services Department also often requires coordination on cultural resource preservation with the NSB Iñupiat History, Language, and Culture Department before issuing some permits. The potential need for a cultural resources survey should be considered during the early stages of any project development.

In addition to the protected sites included in this chapter, there are other sites across the North Slope that either have the potential to be nominated for inclusion on the National Register of Historic Places or worthy of preservation without a National Register of Historic Places designation.

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10 North Slope Borough. 2018. *Traditional Land Use Inventory.*
National Historic Landmarks

Birnirk Archeological Site\textsuperscript{14} The Birnirk archeological site, located in Utqiagvik, is comprised of 16 mounds located near the beach. This site is associated with the Birnirk and Thule cultures, precursors to the modern day Iñupiaq culture.

Gallagher Flint Station Archeological Site\textsuperscript{15} This site was found in 1970 during environmental surveys for the construction of the Trans-Alaska Pipeline. It was the earliest dated archeological site in Northern Alaska. It demonstrates strong affinities between the indigenous peoples of Alaska and Siberia. The site is located on a prominent gravel hill left behind by a melting glacier in the Upper Sagavanirktok (Sag) River Valley. This area has been used repeatedly over the past 10,000 years.

Ipiutak Site\textsuperscript{16} The Ipiutak Site, located near the village of Point Hope, is one of the largest prehistoric village archeological sites in Arctic Alaska. It is made-up of over 500 house ruins along the beach ridges of the Tikigaq spit, and is believed to have been used over 1,800 years ago. The houses were constructed by using massive whale and walrus bones as girders. The Ipiutak are also well known for elaborate decorative carving in ivory, wood, bone, and stone artifacts. With Point Hope, these sites convey the long history of the Iñupiat and their ancestors in North America. Severe fall storms and the resulting floods pose a threat to the site.

Leffingwell Camp Site\textsuperscript{17} This is the campsite of geologist and polar explorer Ernest de Koven Leffingwell that is located on Flaxman Island, approximately 58 miles west of Kaktovik along the Arctic coast of Alaska. As part of the Anglo-American Polar Expedition, Leffingwell was a pioneer scientific researcher and explorer in the area. He lived in this camp from 1906 through 1914.

Table 1: National Register of Historic Places (in alphabetical order)\textsuperscript{18}

<table>
<thead>
<tr>
<th>Title</th>
<th>Period of Significance</th>
<th>Location</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluakpak (Coal Mine #3)</td>
<td>1900–1924</td>
<td>Wainwright</td>
<td>The site consists of the main outcappings of coal. Remains of human use are found at a camp upriver from the main deposits at the mouth of a small stream that enters into the Kuk.</td>
</tr>
<tr>
<td>Anaktuuk</td>
<td>1499 – 1000 AD</td>
<td>Wainwright</td>
<td>Prehistoric; Historic – Aboriginal; Economics; Exploration/Settlement</td>
</tr>
<tr>
<td>Atanik</td>
<td>1499 – 1000 AD, 1825 – 1924</td>
<td>Wainwright</td>
<td>Prehistoric; Historic – Aboriginal; Economics; Exploration/Settlement</td>
</tr>
<tr>
<td>Avaltkuk</td>
<td>1925 – 1949</td>
<td>Wainwright</td>
<td>Prehistoric; Historic – Aboriginal; Economics; Exploration/Settlement</td>
</tr>
<tr>
<td>Birnirk Site</td>
<td>1000 – 500 AD</td>
<td>Utqiagvik</td>
<td>Prehistoric</td>
</tr>
<tr>
<td>Gallagher Flint Station Archeological Site</td>
<td>8500 – 8999 BC</td>
<td>Sagwon</td>
<td>Prehistoric</td>
</tr>
<tr>
<td>Ipiutak Archeological District</td>
<td>499 – 0 AD, 1925 – 1949, 1900 – 1750 AD, 1749 – 1500 AD, 1499 – 1000 AD, 1000 – 500 AD</td>
<td>Point Hope</td>
<td>Prehistoric; Historic - aboriginal</td>
</tr>
<tr>
<td>Ipiutak Site</td>
<td>499 – 0 AD</td>
<td>Point Hope</td>
<td>Prehistoric</td>
</tr>
<tr>
<td>Ivishaat</td>
<td>1800 – 1949</td>
<td>Wainwright</td>
<td>Historic - aboriginal</td>
</tr>
<tr>
<td>Leffingwell Camp Site</td>
<td>1914, 1906</td>
<td>Flaxman Island</td>
<td>This site served as Ernest de K. Leffingwell's scientific headquarters on the Arctic coast of Alaska, from which he conducted his pioneering scientific research and explorations.</td>
</tr>
<tr>
<td>Napanik</td>
<td>1900 – 1924</td>
<td>Wainwright</td>
<td>Historic – aboriginal; Economics</td>
</tr>
<tr>
<td>Negilik Site</td>
<td>1900 – 1924, 1875 – 1899, 1850 – 1874, 1825 – 1849, 1499 – 1000 AD</td>
<td>Wainwright</td>
<td>Prehistoric; Historic – Aboriginal; Commerce; Communications</td>
</tr>
<tr>
<td>Point Barrow Refuge Station (later Cape Smythe Whaling and Trading Station)</td>
<td>1875 – 1899</td>
<td>Utqiagvik</td>
<td>It is both the oldest and most significant American-built frame structure standing along the vast reaches of the Arctic Ocean between the Seward Peninsula and Demarcation Point at the Canadian Border. The building, its management, and related events, played a significant role in commerce, whaling, fur trading, exploration, and development of the region.</td>
</tr>
<tr>
<td>Prudhoe Bay Oil Field</td>
<td>1950 – 1974</td>
<td>Prudhoe Bay</td>
<td>The Prudhoe Bay Oil Field is the largest oil field discovered in the United States and the fourth largest in the world. It brought unexpected and almost unimaginable prosperity to the financially strapped new State of Alaska and rapid change to the Iñupiat people on the North Slope.</td>
</tr>
</tbody>
</table>

### Rogers-Post Site
(Walakpa Bay Crash Site; Will Rogers-Wiley Post Monuments)

<table>
<thead>
<tr>
<th>Title</th>
<th>Period of Significance</th>
<th>Location</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rogers-Post Site</td>
<td>1925 – 1949</td>
<td>Utqiagvik</td>
<td>This memorial site is located approximately 13 miles south of Barrow. The first memorial was constructed in 1938 by public subscription of thousands of Americans and under the organized efforts of friends and admirers in Oklahoma and Texas. The second monument was constructed by a lone admirer of Will Rogers in 1953. The original memorial was moved to higher ground in 1973 and now sits next to the second memorial.</td>
</tr>
</tbody>
</table>

### Ukpeaġvik Church Manse

<table>
<thead>
<tr>
<th>Title</th>
<th>Period of Significance</th>
<th>Location</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ukpeaġvik Church Manse</td>
<td>1925 – 1949</td>
<td>Utqiagvik</td>
<td>The manse was built in 1929. Dr. Henry W. Greist, who lived in Utqiagvik from 1921 to 1925 and again from 1929 to 1936 was the church pastor as well as a physician for the community; the Manse served as both his home and an outpatient clinic.</td>
</tr>
</tbody>
</table>

### Uyagaagruk
(Oyagaruk)

<table>
<thead>
<tr>
<th>Title</th>
<th>Period of Significance</th>
<th>Location</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uyagaagruk (Oyagaruk)</td>
<td>1900 – 1924</td>
<td>Historic – Aboriginal; Economics</td>
<td>Historic and Aboriginal; Economics</td>
</tr>
</tbody>
</table>

### Iñupiaq Values and Knowledge

The residents of the North Slope honor their cultural ties to the land and their ancestors when practicing traditional Iñupiaq values. The Iñupiat highly regard family, work ethic, the Iñupiaq language, drumming and dancing, subsistence hunting and gathering, sharing food, and knowledge of animals. The Iñupiat have a deep respect for the environment in which they live as it provides fresh water, clean air, and subsistence foods. Table 2 summarizes values of the North Slope Iñupiat.

Traditional and contemporary knowledge is an integral part of Iñupiat cultural identity, embodying wisdom and experience acquired continuously over thousands of years, which is told and retold over many generations. This knowledge is imparted by elders, hunters, gatherers, whaling captains, community leaders, and others about Iñupiaq culture and history as well as the natural environment. Traditional knowledge is continually expanded through contemporary experiences and observations by residents who have spent much of their lives observing the biophysical environment.

Residents have detailed knowledge of local conditions, including routine and historic events, which can affect the location and design of facilities and utilities. Traditional and contemporary local knowledge often provides invaluable information on local conditions—such as flooding, erosion, ice override, storm surges, geological conditions, and migration patterns, among others.

All resource and village development projects within the North Slope Borough should be planned to include consultation with borough staff and village residents early in the process to incorporate traditional and contemporary local knowledge in an appropriate manner. The incorporation of traditional and contemporary local knowledge should be an integral component of the project plan that fosters constructive relationships with both local and Tribal governments.
<table>
<thead>
<tr>
<th>Iñupiat Value</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Paaqfaktualtaįñiq</strong></td>
<td>The Iñupiaq way is to think positive, act positive, speak positive and live positive.</td>
</tr>
<tr>
<td>Avoidance of Conflict</td>
<td></td>
</tr>
<tr>
<td><strong>Nagliktuutiaqŋaŋiq</strong></td>
<td>Though the environment is harsh and cold, our ancestors learned to live with warmth, kindness, caring and compassion.</td>
</tr>
<tr>
<td>Compassion</td>
<td></td>
</tr>
<tr>
<td><strong>Paamaagįľŋaŋiq</strong></td>
<td>Together we have an awesome power to accomplish anything.</td>
</tr>
<tr>
<td>Cooperation</td>
<td></td>
</tr>
<tr>
<td><strong>Iljgiigŋiŋq</strong></td>
<td>As Iñupiat people, we believe in knowing who we are and how we are related to one another. Our families bind us together.</td>
</tr>
<tr>
<td>Family and Kinship</td>
<td></td>
</tr>
<tr>
<td><strong>Qiuqiuŋiŋq</strong></td>
<td>Our hearts command that we act on goodness. We expect no reward in return. This is part of our cultural fiber.</td>
</tr>
<tr>
<td>Humility</td>
<td></td>
</tr>
<tr>
<td><strong>Quvianqunniŋq</strong></td>
<td>Indeed, laughter is the best medicine.</td>
</tr>
<tr>
<td>Humor</td>
<td></td>
</tr>
<tr>
<td><strong>Aŋunialaŋniŋq</strong></td>
<td>Reverence for the land, sea, and animals is the foundation of our hunting traditions.</td>
</tr>
<tr>
<td>Hunting Traditions</td>
<td></td>
</tr>
<tr>
<td><strong>Iñupiuraalaniŋq</strong></td>
<td>With our language, we have an identity. It helps us to find out who we are in our mind and in our heart.</td>
</tr>
<tr>
<td>Knowledge of Our Language</td>
<td></td>
</tr>
<tr>
<td><strong>Piqpakkuqtaŋqniŋq suil Qiksiksrautiaŋqniŋq Utuqqanaaun AllaniuɁlu</strong></td>
<td>Our Elders model our traditions and ways of being. They are a light of hope to younger generations. May we treat each other as our Elders have taught us.</td>
</tr>
<tr>
<td>Love and Respect for our Elders and One Another</td>
<td></td>
</tr>
<tr>
<td><strong>Qiksiksrautiaŋqniŋq Iñuunaŋqvigmuŋ</strong></td>
<td>Our Creator gave us the gift of our surroundings. Those before us placed ultimate importance on respecting this magnificent gift for their future generations.</td>
</tr>
<tr>
<td>Respect for Nature</td>
<td></td>
</tr>
<tr>
<td><strong>Aviktuaqatiigŋiŋq</strong></td>
<td>It is amazing how sharing works. Your acts of giving always come back.</td>
</tr>
<tr>
<td>Sharing</td>
<td></td>
</tr>
<tr>
<td><strong>Ukpiqqutiaŋqniŋq</strong></td>
<td>We know the power of prayer. We are a spiritual people.</td>
</tr>
<tr>
<td>Spirituality</td>
<td></td>
</tr>
</tbody>
</table>

---

Iñupiaq Language

The Iñupiaq language is spoken in northern and northwest Alaska, part of the Northwest Territories in Canada, shown in Map 1. The Iñupiaq language is closely related to the Inuit languages of Greenland and Canada.

Fewer and fewer people living on the North Slope speak Iñupiaq fluently. In addition to anecdotal evidence suggesting that the number of fluent speakers is declining, the Expanded Graded Intergenerational Disruption Scale (EGIDS), a tool used to measure the endangerment or development status of a language, confirms that the Iñupiaq language has become threatened. Iñupiaq is being used for face-to-face communication amongst all generations. The NSB regularly conducts a census, called the North Slope Borough Economic Profile and Census Report (NSB Census). These NSB census reports confirm that the Iñupiaq language is spoken by fewer people and less often than it has been in the past. In 1998, the NSB Census estimated 8.4 percent of households spoke mostly Iñupiaq in the home. By 2003, the number of households speaking Iñupiaq increased to 10.4 percent, then...
decreased to 7.9 percent in 2010 and decreased again to 5.5 percent in 2015, representing a 50 percent decrease of what it had been just twelve years earlier. Additionally, in 2010, 972 (19 percent) of NSB residents spoke Inupiaq fluently. In 2015, the number of speakers dropped to 605 (16.6 percent).

Figures 1 and 2 illustrate the prevalence of fluent and non-fluent NSB residents by age group. Figure 1 illustrates the large percentage of NSB resident over the age of 60 that both speak Inupiaq fluent and prefer to speak it over other languages. The fluency and preference for speaking Inupiaq drops precipitously for younger age groups, primarily those that are under the age of 50. Figure 2 graphically depicts the same trend for non-fluent residents, with the vast majority falling into two categories: ‘Understands at least 24 words’ or ‘Understands 5 – 6 words / understands only a few words.’ These graphs underscore the severity of the Inupiaq language decline on the North Slope and support the EGIDS status for the Inupiaq language. Such is the seriousness of the loss of all Alaska Native languages (including Inupiaq) throughout the state, that in April of 2018, Alaska lawmakers passed resolution declaring a “linguistic emergency”.

The borough places great importance on expanding fluency in Inupiaq to preserve traditional culture and values. The North Slope Borough School District (NSBSD) has been making a concerted effort to strengthen the Inupiaq language by offering language learning as early as three years old. The NSBSD Board of Education adopted the Inupiaq Learning Framework (ILF) in 2010. This program focuses on Inupiaq values, culture, history, language, and world view that serve as the foundation for curriculum development and student instruction. The Inupiat-centered orientation in all areas of instruction aims to empower and inspire students, parents, and teachers to succeed. (Additional information is included in Chapter 12: Education). To assist adults in learning or re-learning Inupiaq, the NSB Inupiat History, Language and Culture Department (IHLC) sponsored the production of an online Inupiaq language program in partnership with the Rosetta Stone program for Endangered Languages.

24 Ibid
26 NSB Census information for prior years does not easily correspond with expanded language questions used in the 2010 and 2015 censuses.
Figure 1: 2015 Fluent Iñupiaq Speakers of the Total Population by Age Group and Fluency Level

![Fluent Iñupiaq Speakers Chart]

Figure 2: 2015 Non-Fluent Iñupiaq Speakers of the Total Population by Age Group and Fluency Level

![Non-Fluent Iñupiaq Speakers Chart]

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30 Ibid
GOVERNANCE AND REGIONAL LEADERSHIP

There are many entities representing different segments of the community across the North Slope, including:

- North Slope Borough
- City governments
- Tribal governments
- Native Corporations
- Arctic Slope Native Association
- Tagiugmiullu Nunamiullu Housing Authority

North Slope Borough

The North Slope Borough is a regional home-rule government comprised of 94,762 square miles of land situated entirely above the Arctic Circle in northern Alaska and is larger than 39 states, as illustrated in Map 2.

The borough retains all home rule borough powers and duties not specifically restricted by its charter or by state law. It provides some services for residents in eight villages: Point Hope, Point Lay, Atqasuk, Wainwright, Utqiagvik, Nuiqsut, Anaktuvuk Pass, and Kaktovik. These powers include taxation, education, planning, platting, and zoning. Its villages have transferred many powers to the borough such as areawide police powers, streets, water, sewers and sewage treatment, garbage and solid waste services and facilities, flood control facilities, health services, transportation, and many utilities (telephone, light, power, and heat). Unlike some other Alaska municipalities, the borough is responsible for airports in the communities of Point Lay, Atqasuk, Wainwright, Nuiqsut, Anaktuvuk Pass, and Kaktovik. While other municipalities in Alaska sponsor airports, such as Juneau, Palmer, Soldotna, and Kenai, the borough is the second largest airport sponsor after the State of Alaska.

The North Slope Borough has a Planning Commission with eight members and eight alternates; one member and one alternate member are from each North Slope community. All commissioners are appointed by the NSB Mayor and confirmed by the NSB Assembly for three year terms. The Planning Commissioners perform planning and zoning functions on behalf of the borough, including issuing platting, variance, and conditional use approvals. They also review and make recommendations to the NSB Assembly on capital improvement program funding. The members also serve as representatives of their respective communities and use their position to bring issues and concerns of their communities to the attention of the North Slope Borough administration.

The North Slope Borough Assembly is comprised of eleven members representing eight villages; each serves a three year term. There are six members representing Utqiagvik, and one member for each Nuiqsut, Point Hope, and Wainwright. Anaktuvuk Pass and Kaktovik share one Assembly member, as do Atqasuk and Point Lay. The Assembly enacts laws; appropriates funds for departmental budgets and NSBSD; awards contracts over $300,000; establishes the mill levies; acts as Board of Equalization to hear property tax assessment appeals; confirms appointments of department directors; confirms all appointments of boards and commissions, including the Planning Commission; and certifies North Slope Borough elections. The Assembly members travel to NSB villages to hold meetings regularly, about twice per year.

The borough executive and administrative power is vested in the borough mayor. The mayor appoints mayoral advisors, department directors and deputy directors, and assistants to directors. There are fourteen NSB departments. The Public Works Department employs the most staff members of any department.

City Governments
All communities in the North Slope Borough are incorporated as second-class municipalities with the exception of Point Lay, which does not have an incorporated local government, and Utqiagvik, which is a first class city. In Alaska, all local governments have certain duties, which vary considerably. Second-class cities are not allowed to provide some services, such as public education; may provide other services, such as planning, platting, and land use regulation; and are required to hold regular meeting of the
governing body and conduct elections. Some communities are beginning to express interest in resuming some local powers that were transferred to the borough, including establishing zoning boards to make recommendations to the NSB Planning Commission and NSB Assembly on land use related issues.

Tribal Governments & Organizations

Each of the North Slope communities has a federally recognized Tribal government and an active Tribal council. In addition to the federally-recognized local Tribal governments, there are two regionally active Tribal organizations in Alaska – the Iñupiat Community of the Arctic Slope (ICAS) and Tlingit Haida Central Council in Southeast Alaska. ICAS is the regional Tribal government for all the North Slope villages. It was established in 1971 as an Indian Reorganization Act (IRA) government. ICAS provides assistance in realty, transportation, resource management, among others.

Native Corporations

ASRC, based in Utqiaġvik, is a private and for-profit regional Native corporation that represents the business interests of its approximately 13,000 Iñupiaq shareholders that primarily live in the eight North Slope communities. It was established through the ANCSA in 1972. ASRC is the largest Alaskan-owned company, employing nearly 12,000 people worldwide. The Corporation’s operations are strongly based in natural resources, holding title to approximately five million acres of land.

In addition to ASRC, village Native corporations were established to represent the interests of residents of each village: Atqasuk Corporation, Cully Corporation (Point Lay), Kaktovik Iñupiat Corporation, Kuukpik Corporation (Nuiqsut), Nunamiut Iñupiat Corporation (Anaktuvuk Pass), Olgoonik Corporation (Wainwright), Tikigaq Corporation (Point Hope), and Ukpeaġvik Iñupiat Corporation (Utqiaġvik). While the corporations are not governing bodies, they are influential in decisions made by local and regional governments and represent leadership entities on the North Slope that work in conjunction with local and regional municipal governments and Tribal governments.

Arctic Slope Native Association

ASNA is a Tribal nonprofit health and social services organization that has a long history in the North Slope Borough.

Formed in 1965, by original founders Samuel Simmonds, Guy Okakok, Sr., and Charles ‘Etok’ Edwardsen, Jr., ASNA was originally created to help protect the lands of the Arctic Slope region, beginning the process that led to the Alaska Native Land Claims Settlement Act. ASNA was dormant from 1985 to 1991 when, with assistance from ASRC and NSB, ASNA was reactivated to pursue goals of self-determination for health and social services programs. Because ASNA is a non-profit Tribal organization, it receives federal funds on behalf of the Bureau of Indian Affairs. ASNA currently

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33 A comprehensive resource for powers of Alaska’s municipalities is provided by the Alaska Department of Community, Commerce, and Economic Development at: www.commerce.alaska.gov/web/Portals/4/pub/2015%20%20LOCAL%20GOVERNMENT%20IN%20ALASKA.pdf.
34 Additional information on ANCSA is provided in Chapter 15.
manages the Samuel Simmonds Memorial Hospital through a governing board.36

Maniilaq Association (Kotzebue) and Tanana Chiefs Conference (Fairbanks) provide health and social services in Point Hope and Anaktuvuk Pass, respectively.

Housing Authorities
Housing authorities are independent agencies governed by the U.S. Department of Housing and Urban Development (HUD). HUD places certain guidelines on housing authorities’ operations. However, they have their own boards, managers, and often rules and guidelines. A housing authority’s day-to-day operations are overseen by an executive director.

Tagiugmiullu Nunamiullu Housing Authority (TNHA) is the North Slope’s regional housing authority organized through ASNA as provided by Alaska Statute (AS) 18.55.995 and 18.55.996. It provides programs and services in all eight North Slope communities. TNHA offers affordable rental programs; a lease-purchase Mutual Help homeownership program; an elder housing program and housing rehabilitation services. TNHA has initiated a Sustainable Northern Shelter (SNS) new home construction program, which focuses on using lightweight or local materials and maximizing energy efficiency.37

There are two other housing authorities on the North Slope administered by the Native Village of Point Hope and the Native Village of Barrow. Both of these Tribal housing authorities are eligible to receive federal funding to provide safe, sanitary and affordable housing to its members.

REVENUE AND BUDGET
Since its creation in 1972, the North Slope Borough has had the power to collect property tax. Taxation of oil and gas property provides the vast majority of the borough’s total property tax revenue.

Property taxes, assessed by both the State of Alaska and the borough, provided about 90.8 percent of the borough’s revenue in 2017.38 The State of Alaska administers the tax on oil and gas properties under AS 43.56, and it shares that tax with the borough. The NSB is wholly responsible for assessing non-oil and gas local taxes under AS 29.45.

The borough dedicates a significant portion of its revenue to the vision of its first mayor, Eben Hopson, of providing residents with the basic services enjoyed by other Americans. The NSB budget, coupled with both state and federal programs, funded the construction of houses, utilities, public buildings, and schools. During the 1970s and 1980s, personal and household income within the borough increased dramatically, for both Iñupiat households and others who migrated to the NSB to work in this resource rich region.39

In 2017, total general fund revenues increased by approximately $12.16 million (2.8 percent) between fiscal year (FY) 17 and FY16. The increase is revenue correlates to the $600 million increase in the assessed property value from FY17 to FY16. At the same time that the property tax revenue increased, intergovernmental revenues decreased by $4.4 million (20.3 percent). This decrease is primarily due to a decrease in pass-through funding to the borough from the State of Alaska due the economic downturn.40

A fund is a grouping of related accounts that is used to maintain control over resources that have been segregated for specific activities or objectives. The borough, like other state and local governments, uses fund accounting to ensure and demonstrate compliance with finance-related legal requirements. All of the funds of the borough can be divided into categories: governmental funds, Capital improvement funds, proprietary funds, fiduciary funds, and permanent funds. While Table 3 details the uses of each of these types of funds, Figure 4 provides a breakdown of how the NSB general fund is spent by department. Figure 5 describes the various sources of revenue the borough receives.

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Table 3: Types of Funds

<table>
<thead>
<tr>
<th>Fund Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Government Fund</strong></td>
<td>Primary operating fund for the borough that funds operations for NSB departments: Police, Fire, Search and Rescue, Public Works, Planning and Community Services, Health and Social Services, Law, Human Resources, Iñupiat History, Language and Culture, Wildlife Management, etc. The largest source of revenue for the general fund is property taxes, primary on industry infrastructure. Other sources of revenue for the general fund are charges for services and grants.</td>
</tr>
<tr>
<td><strong>Capital Improvement Program Funds</strong></td>
<td>Funds the construction, renovation, and repair of borough-owned buildings and infrastructure. Revenue for this funds comes primarily from the issuance of general obligation bonds and also from federal and state funding. The borough issues about $80 – $100 million annually in general obligation bond funds for capital projects. In 2017, the NSB had a capital project fund balance of $255,620,176. This is unspent funds that have been dedicated to funding capital improvement projects throughout the borough.</td>
</tr>
<tr>
<td><strong>Proprietary Funds</strong></td>
<td>Enterprise Funds are established by a governmental entity to account for operations of an enterprise activity. Enterprise funds generally are segregated as to purpose and use from other funds and accounts with the intent that revenues generated by the enterprise activity and deposited to the enterprise fund will be devoted principally to funding all operations of the enterprise activity. Enterprise funds are used for Prudhoe Bay solid waste disposal and treatment facility that are within Service Area 10. The Real Property Management Fund accounts for the management and disposition of revenues associated with real property. The Power &amp; Light Fund includes the power-generating activities for the North Slope communities of Anaktuvuk Pass, Kaktovik, Nuiqsut, Point Hope, Point Lay, Wainwright, and Atqasuk. Transfers into this the Power &amp; Light Fund are the subsidies from the Enterprise Fund. The Home Assistance Loan is a revolving loan fund to assist borough residents in purchasing homes.</td>
</tr>
<tr>
<td><strong>Fiduciary Fund</strong></td>
<td>The Pension Trust Fund accounts for the activities of the borough's Employee Thrift Plan, which accumulates resources for employees’ before- and after-tax savings.</td>
</tr>
<tr>
<td><strong>Permanent Fund</strong></td>
<td>This fund contains assets that are to be held in perpetuity except that an optional annual transfer may be made to the General Fund from the accumulated earnings in an amount up to 8 percent of the average total fair value of the fund at the end of the three preceding fiscal years. Funds may be appropriated to the Permanent Fund from any source. Income of the fund is to be added to the fund. The amount transferred may not be used to pay debt service on the borough’s debt.</td>
</tr>
</tbody>
</table>

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Figure 4: Where the Revenue Comes From

![Revenue Composition Graph]

Figure 5: How the General Fund is Spent

![Expenditure Composition Graph]

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44 Ibid

*Mayor’s Office programs: Government and External Affairs; Healthy Communities Initiative; Mayors Youth Advisory Council; Special Projects; and Village and Tribal Affairs.*
Chapter Two
Comprehensive Planning Background
Nearly 50 years have passed since the formation of the North Slope Borough and 35 years since the development of the first NSB comprehensive plan. The original 1983 Comprehensive Plan addressed many of the same issues as this 2018 plan update addresses: impacts on cultural and historic resources from development activities, community economic development, energy development and conservation, and transportation. The format is somewhat similar to this comprehensive plan update; the 1983 plan provided background information with goals, objectives, and policies for implementation.

However, the borough has experienced profound change over the past 35 years. The complexity of issues has increased since the first comprehensive plan was developed in 1983 and last updated in 2005. The borough’s infrastructure footprint has increased dramatically, through the provision of roads, electricity, water and sewer connections, and telecommunications. The North Slope’s growing population has led to a critical need for additional housing, services, and public infrastructure. The borough has sometimes assumed responsibilities that would not typically be provided by a local government because revenues were able to support services that residents needed. However, as revenues have declined, the borough is not able to continue to provide the same services or same level of service that residents had become accustomed.

This updated 2018 Comprehensive Plan expands its scope to include current issues and challenges faced by the North Slope Borough and its residents in a time of rapid technological advancements, climate change uncertainty, and aging critical infrastructure. This plan serves as a blueprint for future North Slope development while honoring its past, overcoming challenges of the present, and building on its assets to create a prosperous future filled with opportunity.

The first NSB comprehensive plan, adopted by the NSB Assembly in 1983, included its purpose in the preface:

\[\text{This Plan is written for the North Slope Borough community – a community in which Iñupiat people and the Iñupiaq character of life predominate. Consequently, this Plan is absolutely unique. While attempts have been made to reflect and accommodate state and national interests, the Plan has been designed for the values and circumstances of the people of the North Slope Borough.}\]

-1983 NSB Comprehensive Plan

This statement is still true today. The needs of the North Slope community have not changed since the 1983 plan was developed. The North Slope remains the largest petroleum-producing region in Alaska at the same time that borough residents need to maintain opportunities for
subsistence activities and continuing traditional uses of the land and water.

The borough has a very young population; the median age of borough residents is 26, well below the median age for the state and the nation. The population increase influences the need for housing, healthcare, education, subsistence resources, employment, and public services. Expanding oil and gas exploration and development further into the National Petroleum Reserve – Alaska (NPR-A) and potentially ANWR continues to put pressure on residents’ subsistence lifestyle while also potentially increasing employment opportunities for residents. And climate change is making once predictable seasonal weather changes unpredictable.

Ensuring that the comprehensive plan remains updated to reflect current circumstances is important to the borough’s current and future development.

PURPOSE OF PLANNING

Comprehensive plans are designed to guide the future actions of a community or region. A comprehensive plan also contains a vision for the future coupled with background information that provides the foundation for long-range goals and objectives for activities that affect land use, residents, and government.

Table 4: Comprehensive Plans Do and Do Not

<table>
<thead>
<tr>
<th><strong>Comprehensive Plans</strong></th>
<th><strong>DO</strong></th>
<th><strong>Comprehensive Plans</strong></th>
<th><strong>DO NOT</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Establish a baseline / inventory of current conditions</td>
<td>Bind a community to one particular development scenario</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide a voice for the community or region</td>
<td>Focus on development for specific parcels of land</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Guide growth</td>
<td>Guarantee funding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identify issues for further study</td>
<td>Remain static</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Establish long-term goals</td>
<td>Build or implement projects</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Demonstrate need for programmatic modifications</td>
<td>Limit development flexibility</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Evolve and change as issues and perspectives change</td>
<td>Directly regulate development or programs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provide a foundation for grant funding</td>
<td>Provide project funding</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Protect property values</td>
<td>Approve or authorize a project</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Help to minimize environmental damage and minimize land use conflicts</td>
<td>Prescribe exactly what course of action must be taken in the future</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Add value to the decision-making process and defensible decisions for both local governments and the private sector</td>
<td>Change laws or regulations</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Serve as an umbrella plan for many other planning efforts</td>
<td>Enact a new zoning ordinance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Have analysis that helps to anticipate future issues and trends</td>
<td>Create a method for taxation</td>
<td></td>
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</tbody>
</table>
More specifically, comprehensive plans are intended to guide growth and development of the region; provide anticipated capital needs over a 20 year planning horizon; serve as the foundation to land use planning and regulations, infrastructure investments, and land use policy decisions (Table 4).

Where comprehensive plans are broad, planning tools that implement comprehensive plans are often specific and detailed. A comprehensive plan and a zoning ordinance are two separate tools that are used in conjunction with one another. A comprehensive plan provides general guidance on how land should be used to meet the needs and desires of the community, whereas a zoning ordinance regulates specific land uses and developments. Subdivision regulations, design guidelines, capital improvement plans, master plans, area plans, are also tools that implement the comprehensive plan, as shown in Figure 6.

This North Slope Borough Comprehensive Plan is a long-range document intended to guide the development of the borough and it’s Area of Influence\(^5\) over the next 20 years and beyond. The plan is a consolidated and coordinated approach to community planning and land development.

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\(^5\) The NSB Area of Influence is the amalgamation of the borough’s boundaries and the individual village areas of influence. The boundary shown for Nuiqsut is a draft only. It has not been endorsed by the community or adopted by the NSB.
LEGAL BASIS FOR COMPREHENSIVE PLANNING

Title 29 of the Alaska Statutes provides the authority for comprehensive planning in Alaska. Alaska Statute and the North Slope Borough Municipal Code (NSBMC) are nearly identical in their requirements for a comprehensive plan.

The comprehensive plan is a compilation of policy statements, goals, standards, and maps for guiding the physical, social, and economic development, both private and public and may include but is not limited to the following:

- statements of policies, goals, and standards;
- a land use plan;
- a community facilities plan;
- a transportation plan; and
- recommendations for implementation of the comprehensive plan (AS §29.40.030 and NSBMC §2.12.170).

Alaska Statutes calls for planning commission responsibilities in both the development and implementation of comprehensive plans. Per AS 29.40.020(b)(2), the commission must “review, recommend, and administer measures necessary to implement the comprehensive plan, including measures provided under AS 29.40.040.” Measures provided under 29.40.040 include zoning regulations, land use permits, measures to further the implementation of the comprehensive plan, and the administration of variances.

The NSBMC requires the Planning Commission to consider amendments to the comprehensive plan from time to time ($19.30.050), undertake an overall review of the plan at least once every two years ($2.12.170) and review and report to the Assembly the location, design, construction, demolition, or disposition of any public building, facility, collector or arterial street, park, greenbelt, playground or other public facility based on the comprehensive plan and the capital improvements program ($19.30.050).

The NSB Department of Planning and Community Services implements land use planning and regulation for the borough. Its goals include regulating and monitoring development; managing borough owned real estate; planning for future growth; enhancing community sustainability and overall health; and supporting local traditions and lifestyles. The NSB Planning Department’s Community Planning and Development Division oversees the development and implementation of the borough’s regional comprehensive plan and eight village comprehensive plans. This Division also facilitates the annual capital project request process, coordinates development of the NSB Six-Year Capital Improvement Plan that outlines anticipated capital needs over the current year and the next five years, and manages the subdivisions and platting processes.

PLAN USERS

The North Slope Borough uses this plan when evaluating land use proposals or actions, including approval of subdivisions, changes to zoning districts, issuing permits, and making capital improvement recommendations. The borough also uses this plan in guiding the location, timing, and scale of community development and infrastructure investments. The plan will also be useful for assessing both

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community and regional needs based on trends and population projections while considering the protection of important environmental and cultural resources. The borough may also use this plan to develop mitigation measures as conditions of permit approval.

Federal and state agencies and potential project funding sources are encouraged to use this plan to understand regional values, needs, and priorities for investment. Some funding streams are only available if a potential project is listed within or is consistent with the goals and policies of an adopted comprehensive plan.

Private landowners, developers, and Native corporations may use this plan to help guide development decisions and investment choices. Community and regional data, maps, and policies help these entities design projects compatible with community values and needs to meet expectations. Borough residents can use this plan to advocate for a better future that is consistent with needs and resources. Infrastructure and level of service planning with population trends also help citizens stretch available funding for more efficient and effective government service. A primary interest for the future development of the region is to ensure the traditional way of life, protect marine and wildlife habitats, and protect communities from coastal storms and flooding and from the adverse effects of resource development.

Ultimately, the plan seeks to conserve valued resources and uses while encouraging development that meets the needs of the present population without compromising options for future generations.
HISTORY OF PLANNING ON THE NORTH SLOPE

Planning is not a new endeavor on the North Slope. There has been a substantial number of planning efforts in the North Slope Borough since its creation at all levels of government.

1972 The North Slope Borough is created by election
1974 NSB adopted a Home Rule Charter on August 30th
1975 NSB Planning Department conducts the first NSB-led boroughwide census
1979 Interim zoning ordinance adopted (serial no. 75-6-6)
1983 The first NSB Comprehensive Plan was adopted by the North Slope Borough Assembly
1986 The Gates of the Arctic National Park and Preserve General Management Plan approved by the National Park Service (NPS)
1991 Bureau of Indian Affairs adopts the Recreation Area Management Plan for the Dalton Highway
1993 Attempted revision of the Comprehensive Plan
1998 The Dalton Highway Master Plan is created by the State of Alaska
1998 NSB publishes the Economic Profile and Census Report Volume VIII
2003 NSB publishes the Economic Profile and Census Report Volume IX
2004 The Northwest Alaska Transportation Plan is adopted by the State of Alaska
2004 The Northwest National Petroleum Reserve – Alaska draft Amended Integrated Activity Plan / Environmental Impact Statement is complete
2004 North Slope Borough Local All Hazards Mitigation Plan is adopted
2005 Public review draft, North Slope Borough coastal management plan
2005 Updated Boroughwide Comprehensive Plan and Long Range Transportation Plan is adopted by the North Slope Borough Assembly

2008 The Kobuk Seward Peninsula Record of Decision and Resource Management Plan is approved by the Bureau of Land Management (BLM)

2008 The Northwest Area Plan for state lands adopted by the Alaska Department of Natural Resource

2010 NSB publishes the Economic Profile and Census Report Volume X

2011 The first Memorandum of Understanding between NSB and the Alaska Department of Natural Resources for joint activities to improve communication and coordination of activities related to North Slope oil and gas development is executed

2011 Alaska Coastal Management Program Withdrawal from the National Coastal Management Program under the Coastal Zone Management Act47

2011 The NSB Repair and Replacement Schedule is developed that tracks all the borough’s capital assets

2013 The National Petroleum Reserve – Alaska BLM Integrated Activity Plan and Environmental Impact Statement is approved

2014 The North Slope Borough Health & Social Services Department completes the Baseline Community Health Analysis Report and Health Impact Assessment

2014 The Wainwright Comprehensive Plan is adopted by the NSB Assembly

2014 The NSB Oil and Gas Technical Report is completed

2014 The Gates of the Arctic National Park and Preserve General Management Plan Amendment / Wilderness Stewardship Plan / Environmental Assessment is approved

47 All NSB provisions in the Alaska Coastal Zone Management Program are retain in NSBMC Title 19.
2015 The Wainwright Comprehensive Plan is adopted by the NSB Assembly
2015 The Barrow and Kaktovik comprehensive plans are adopted by the NSB Assembly
2015 NSB Publishes the Economic Profile and Census Report Volume XI
2015 Arctic National Wildlife Refuge Comprehensive Conservation Plan and Final Environmental Impact Statement released by the United States Fish and Wildlife Service (USFWS)
2015 North Slope Management Plan under development by the Alaska Department of Natural Resources
2016 DRAFT Conceptual Regional Mitigation Strategy Document and Technical Companion for the Northeastern Region of the NPR-A
2016 The Anaktuvuk Pass Comprehensive Plan is adopted by the NSB Assembly
2017 The Point Hope Comprehensive Plan is adopted by the NSB Assembly
2017 The Atqasuk Comprehensive Plan is adopted by the NSB Assembly
2017 The Point Lay Comprehensive Plan is adopted by the NSB Assembly
2017 The first Memorandum of Understanding between NSB and the Alaska Department of Transportation & Public Facilities to improve communication and coordination of North Slope transportation-related activities is executed.
2018 The BIA Central Yukon Resource Management Plan / Environmental Impact Statement under development
2018 The NW Area Transportation Plan update is under development by the Alaska Department of Transportation & Public Facilities
2018 Arctic Strategic Transportation and Resources (ASTAR) project to prioritize community needs and infrastructure for cumulative benefits, begins
COMMUNITY BASED PLANS

The North Slope Comprehensive Plan was last updated in 2005. This 2018 update builds on the 2005 plan content in a new user-friendly format. It features an executive summary translated to Iñupiaq, expanded sections on public facilities, housing, climate change, Service Area 10, and energy as well as updated information on land ownership and land use, education, health and safety, and population characteristics and projections. The goals, objectives, and strategies are now provided in a more condensed and usable format and also designed to provide easy reference for capital infrastructure projects.

The 2018 comprehensive plan update began with replacing the individual community profiles with distinct comprehensive plans that provide more in-depth information and are coupled with goals, objectives, and implementing strategies to achieve each village’s vision for the future. The development of these plans focused on village resident input, perceptions, needs, and expectations gathered through public meetings and workshops as well as close coordination with each village’s city council, Tribal council, and village corporation. The result is plans that reflect the current and future needs of the communities as expressed by the residents and village leadership.

This village planning effort was first initiated in 2010, focusing on the communities of Anaktuvuk Pass, Kaktovik, and Nuiqsut. These efforts stalled for a number of years due to competing priorities. Plan development was reinvigorated in 2013 when the NSB Planning & Community Services Department sought consultant assistance in developing new plans to replace the village profiles for Wainwright and Utqiagvik and to complete a plan developed internally by NSB staff for Kaktovik. These three village comprehensive plans were all recommended for adoption by the respective cities and Tribal governments, the village corporations, and the NSB Planning Commission. The plans were adopted by the North Slope Borough Assembly in 2014.

The Anaktuvuk Pass Comprehensive Plan was adopted in late 2016 and the comprehensive plans for Point Hope, Point Lay, and Atqasuk were adopted in 2017. The Nuiqsut plan is currently on hold at the request of the community. These four plans have been developed under a Public Interest Determination contract between the North Slope Borough Planning & Community Services Department, ASRC Energy Services, and UMIAQ Environmental / UMIAQ Design and Municipal Services (UIC subsidiaries). This contracting mechanism establishes a long-term relationship amongst the borough, the two companies, and community enterprises that have an intrinsic interest in the future of the North Slope.

This Borough Plan and the village plans are intended to complement each other; the information and goals, objectives, and implementing strategies should be consistent where possible and defer to village plans for village-specific issues or concerns. The plans should not be viewed as hierarchical; rather, they are all pieces of one vision for the North Slope.

In 2015, a Quality Improvement Team (QIT)48 was developed to oversee the comprehensive

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48 also referred to as the Comprehensive Planning Stakeholder Committee.
plan development process and provide strategies for improvement. The team is made up of one representative from each North Slope village with an executive committee that includes representatives from the North Slope Borough Mayor’s Office, the Planning and Community Services Department Director and Deputy Director, and leadership from both ASRC and UIC. The team meets quarterly to collaboratively overcome challenges, improve the planning process, increase community awareness and involvement, and continuously improve the quality of plans and consultant performance on the contract. The team also provides an update to the NSB Assembly annually.

Table 5: NSB Village Comprehensive Plans

<table>
<thead>
<tr>
<th>Village Comprehensive Plan</th>
<th>Date of Adoption</th>
<th>Ordinance Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wainwright</td>
<td>June 3, 2014</td>
<td>75-06-63</td>
</tr>
<tr>
<td>Barrow</td>
<td>March 3, 2015</td>
<td>75-06-64</td>
</tr>
<tr>
<td>Kaktovik</td>
<td>April 7, 2015</td>
<td>75-06-65</td>
</tr>
<tr>
<td>Anaktuvuk Pass</td>
<td>September 13, 2016</td>
<td>75-06-67</td>
</tr>
<tr>
<td>Point Hope</td>
<td>May 2, 2017</td>
<td>75-06-68</td>
</tr>
<tr>
<td>Point Lay</td>
<td>October 10, 2017</td>
<td>75-06-70</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>November 14, 2017</td>
<td>75-06-71</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>On hold at the community’s request</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**PLANNING PROCESS**

The planning process to develop a comprehensive plan is designed to be transparent and inclusive. It was critical in the development of this comprehensive plan that all residents have abundant and meaningful opportunities to review, participate, and contribute to the draft plan.

One of the primary methods to garner public input during the development of this plan and all the village comprehensive plans has been hosting a Strengths, Weaknesses, Opportunities and Threats Analysis (SWOT) workshop to guide workshop discussions. Participants are asked to identify strengths and weaknesses as well as opportunities and threats in a community or a region. The information provided by participants helps to create an understanding of critical needs, develop plan priorities and establish buy-in for decision-making. The SWOT exercises are also used to develop a Vision Statement and provides guidance in developing the goals, objectives, and implementing strategies found in Chapter 3. During the workshops, participant comments were noted on easel paper, projected overhead, and included in workshop meeting notes.

The steps for developing this areawide plan are illustrated in Figure 7. Collaboratively, North Slope leadership, residents, and the North Slope
Borough Planning and Community Services Department staff developed this plan.

The following public participation tools were used to obtain input:
- Public notices posted in each village providing notification on meeting dates and locations;
- Handouts during public meetings that included comprehensive planning background information, maps, etc.;
- A borough leadership kick-off workshop that included an introduction to comprehensive planning followed by broad based SWOT discussion was held on April 9, 2018 (provided in this chapter);
- Four focused SWOT workshops for discussions on critical issues within the borough: health, housing, public facilities, and education. These SWOTs were held on April 10 and 11, 2018 (provided in this chapter);
- Discussion with the members of the Barrow High School student council on April 24, 2018 about the future of their community and how they would like it to develop over the next twenty years (included in Appendix C);
- Workshops presenting an overview of the draft plan for community review, discussion, and comment were held on the following dates in 2018:
  - Anaktuvuk Pass – October 4
  - Atqasuk – October 10
  - Kaktovik – October 1
  - Nuiqsut – October 2
  - Point Hope – October 23
  - Point Lay – October 11
  - Utqiagvik – December 5
  - Wainwright – October 3
• Direct contact with borough/community leaders through phone and in-person interviews; and
• Meeting and other announcements were made on the North Slope Comprehensive Planning Facebook page and on KBRW.

Although this areawide plan has a 20-year planning horizon, conditions, issues, and priorities will undoubtedly shift. Regular review and revision of this plan ensures that the goals and strategies respond to changing circumstances and needs within the region and its areas of influence. To remain current and useful, this plan should be reviewed frequently for potential updates and revisions. Future plan revisions should monitor growth, evaluate development and related programs, and measure how well the plan is meeting the region’s goals, objectives and implementing strategies.
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1. STRENGTHS, WEAKNESSES, OPPORTUNITIES, THREATS

Kick-Off Workshop
April 9, 2018

Strengths

- NSB Permanent fund
- Abundance of natural gas and other mineral resources
- Gas transfer act
- Economic tax base
- 6 Year Plans
- Low cost capital bonding capacity
- Youth programs and youth input – Mayor’s Youth Advisory Council (MYAC)
- Subsistence lifestyle
- Native language speakers
- Service Area 10
- Subsistence, local traditional knowledge, and cultural way of life
- Port authority is established
- Subsistence: only municipality that has created a wildlife department
- Ordinances can provide work to corporations
- Close-knit community atmosphere
- Ilisaġvik College
- Borough home rule charter that allows Mayoral authority

Weaknesses

- Dependence on fossil fuels and logistics of fuel delivery
- Revenue is not keeping up with cost of capital maintenance or replacement
- Permitting process allows industry to develop where and when they want; industry not required to address residents’ concerns
- The comparisons between Utqiagvik and the villages; needs are different
- Too much reliance on borough services
- Lack of teamwork, too many independent sectors (silos) and piecemeal activities
- Not enough recreational/entertainment activities
- Lack of childcare
- Lack of hospice care or facilities
- Villages often feel left out of decision-making
1. Kick-Off Workshop April 9, 2018

**Opportunities**

- Involve youth more proactively
- Undeveloped mineral deposits on the western side of the borough
- Villages want local self-determination
- Fiber optics and worldwide connections
- Borough increase partnerships with tribes and corporations
- A future road system would allow greater infrastructure expansion and investment in villages
- Regional power plant
- Expand Service Area 10
- Merge NSB Health Department and ASNA
- Port authority bonding potential apart from NSB
- Industry mitigation funds for capital needs
- Utilize contamination clean-up to subsidize transportation systems, etc. through cost sharing
- Succession planning
- Improve process/ordinance to direct work to local communities and village/regional corporations
- Better collaboration on comprehensive plans at department level
- Establish regional training center for police and fire protection
- Foster police officers, teachers, pilots, and professionals from within the community

**Threats**

- Climate change effects on subsistence and food security
- Climate change increasing extreme weather events/conditions
- Contaminated federal site clean-up lack of coordination and land use planning
- Iñupiaq language is endangered
- Boredom can lead to substance abuse
- Inconsistency and complicated co-management regimes (fed, state)
- Coastal erosion
- Increased marine traffic
2. STRENGTHS, WEAKNESSES, OPPORTUNITIES, THREATS

Focused Workshop: Education
April 10, 2018

**Strengths**
- Place-based and culture-based education lets students see themselves in a positive role in their community
- NSB graduation rate have increased since the initiation of placed-based education
- Iḷisaġvik College works with the schools to see what educational training is needed
- Strong North Slope Borough School District strategic plan
- Iḷisaġvik works with Industry on employment needs
- Educational programs, like Alaska Native Science and Engineering Program (ANSEP), distant delivery, homeschooling
- 16 career clusters/pathways that assist kids in understanding and deciding on a career
- NSBSD offers pre-kindergarten through high school education
- The borough is investing in childcare
- Career ladder programs and other incentive programs are available
- Advisory committees and apprenticeship programs are available at Iḷisaġvik College

**Weaknesses**
- Borough revenue is not keeping up with cost of capital maintenance or replacement
- There is a lack of interest from community stakeholders and youth in becoming police officers, teachers, pilots, professionals
- Many buildings and other infrastructure need to be updated and renovated due to their age
- Village infrastructure/facility equity
- High teacher turnover
- Lack of a sufficient number of Iñupiaq speaking teachers
- There is not childcare in all the villages
- Iḷisaġvik College facility is spread throughout Barrow and is not sufficient for needs
- Lack of respect by youth
Opportunities

- Parents need to be proactive and advocate for children and young adults to succeed in school
- Create small businesses utilizing training services and loans
- The road system will allow greater infrastructure expansion and investment in villages
- Establish a regional training center for police and fire protection
- Foster police officers, teachers, pilots, and professionals from within the community
- Teach traditional knowledge to students
- Elders should be more included in school activities
- Ensure village equity in education space and training programs
- Implement DARE program (Drug Alcohol Resistance Program)
- Reinstate the regional leadership team for follow-up and accountability

Threats

- Technology has taken away youth’s desire to learn culture
- Teacher turnover
- Loss of language and knowledge
- Curriculum mandates from state and federal government
- Non-governmental organizations (NGO) are influencing youth
3. STRENGTHS, WEAKNESSES, OPPORTUNITIES, THREATS

Focused Workshop: Public Facilities
April 10, 2018

Strengths

- Established NSB infrastructure
- Commitment to operate and maintain the infrastructure
- Lessons learned for newer facilities; modern engineering and science for arctic standards
- Ability to respond to emergency events
- Home rule charter grants the authority of the Mayor to respond to events in a timely manner
- Airport and location of cities for arctic corridor
- Marine transportation and future access to fiber optics
- The North Slope has abundant natural gas reserves
- Heavy equipment in the villages

Weaknesses

- Lack of renewable/alternative energy resources
- Lack of energy redundancy
- Limited free market economy
- Lack of heavy equipment areawide
- Lack of standardization in current construction and in technology
- Insurance requirements are a burden for small contractors
- Limited number of airlines
- Aging infrastructure
- Bond expense eligibility / bond rating and capacity; tax vs debt capacity
- Deferred maintenance
- Shortfall of capital funding
- Perception of inequity in different communities; home rule/same services provided in all communities
- Marine transportation availability is seasonal
- Existence of abandoned infrastructure
- Infrastructure is sometimes over capacity and needs to expand but there is a lack of funding
3. Focused Workshop: Public Facilities

April 10, 2018

Weaknesses (cont.)

- The existing access to piped water and sewer system is not being fully utilized
- Lack of current technology and technology standardization in infrastructure
- Engineering difficulties due to climate change, the inability to adapt in a timely manner, and insufficient funding
- Continued change in maintenance software programs; consistency is needed
- Lack of search and rescue facility space in villages

Opportunities

- Shared facilities / consolidated facilities (combining NSB and NSBSD M&O facilities; office space in general)
- Succession planning
- Explore renewable resource options
- Develop local and/or regional material resources
- Marine transportation and future access to fiber optics
- Community usage of facilities: shared service and availability
- Consistency in infrastructure and computerized maintenance programs
- Tribal partnerships
- Local or NSB use of land and facilities that are abandoned
- Regional power plant: energy corridors and inter-village connect
- Natural gas development for other communities that desire alternative energy source

Threats

- Existence of abandoned infrastructure that might have environmental impacts (NSB and others)
- Climate change
- Road connection would have negative impacts on lifestyle, culture, hunting, control, additional load on infrastructure, housing
- Dilapidated infrastructure
- Industry population decrease and price of oil
- Tax formula changes at the state level
- State budget downfall impacts the NSB
- Unregulated marine traffic
- Failure to keep up with advancement of technology
- Lack of ports
- Lack of wetlands mitigation bank
New housing is underway or has recently been completed
There are programs available for loans, renovations, upgrades, and weatherization
There are trained carpenters on the North Slope
Newly created NSB Housing Department

Funding for homes and renovations on Native restricted lots is difficult
It is expensive to construct roads to lots and connect homes to services
Probate issues limit use of many Native restricted lots
Federal housing subsidies are inadequate for the need
Overcrowding
Dilapidated housing conditions
The North Slope is one of the few regions in the state that does not have a coalition established to address housing and homelessness issues
Limited collaboration amongst organizations
Over dependency on the North Slope Borough
Building design standards for the Arctic are yet to be implemented and enforced
There is not a regional coalition to address homelessness
Dilapidated housing conditions
Opportunities

- NSB Titles 17, 18, 19 could incorporate building standards and/or a building official
- Storefront for equipment and tools loans and technical assistance for making repairs
- Create a Alaska Native Homeownership Coalition creation for a one-stop shop for grant and loan opportunities for homeownership
- Utilize existing vacant or underutilized lots that already have road access and proximity to piped water/sewer
- Construct modular homes on the North Slope that are easier to transport
- North Slope Borough Municipal Code could be amended to have a two tier sales process for lower income and middle/higher incomes for home purchases
- Provide education on the costs of building and maintaining homes
- Incentivize private developers to invest in housing
- Road connections to the villages could lower material costs
- Condos or zero lot line homes for those that wish to purchase a starter/less expensive home
- More rental properties

Threats

- Annual funding allocations for tribes
- Asbestos and lead paint contamination in older homes
- Alaska State Legislature perceives that there is not a homeless issue on the North Slope
- Current housing situation is having severe negative social, health, and mental health impact on communities
5. STRENGTHS, WEAKNESSES, OPPORTUNITIES, THREATS

Focused Workshop: Health
April 11, 2018

Strengths

- Health Infrastructure on the North Slope
- Financial commitment to support health service / social services
- Ability to provide emergency services
- New regional hospital in Utqiâgvik
- 24-hour law enforcement coverage
- Access to a subsistence diet
- Healthy Communities Initiative
- Subsidized veterinarian services
- Medical Travel and Funeral Assistance (MTFA) program
- Treatment scholarship program
- Arctic Women in Crisis (AWIC)
- Health clinic in each village

Weaknesses

- Aging health infrastructure
- Shortage of local professional workforce attributed to turnover and burnout
- Lack of homegrown health professionals
- Lack of healthy social activities
- Contradiction between technology and culture
- Lack of daycare centers
- Homelessness
- Food insecurity
- No crisis center for men
- Grants don’t always cover programmatic costs
- There are different local health care providers in Anaktuvuk Pass and Point Hope
- Lack of hospice care
Opportunities

- Consolidating/Combining /collaborating on services amongst organizations
- Promote new programs/services for families and homelessness
- Promote and incentivize preventative programs
- Establish an environmental health division or department to coordinate with industry and residents
- Offer parenting classes
- Employers could promote and incentivize volunteerism
- Expand health care services through telemedicine
- Creation of a health consortium

Threats

- Climate change and food security: melting ice cellars, ice pattern changes, changing culture
- Distance between villages and communication system
- Drugs and alcohol: substance abuse and lack of behavioral health and treatment facilities
- Pollutants, including dust
- Unsafe driving practices
- Social media: influence that promotes bullying, constant stimulation, excessive use limits hands-on activities and critical thinking skills
- High Medicaid denial rate
- High rate of cancer
The North Slope Borough’s Area of Influence includes all the area within the borough boundaries. It is a compilation of all the village areas of influence (shown in Map 5) as well as areas outside of the borough boundary, such as Hanna Shoal, Ambler Mining District, and offshore oil and gas leases. Activities in these areas impact, or influence, residents of the North Slope. While the North Slope Borough may not have direct control over the activities in these areas, the borough seeks involvement in planning and development to ensure both borough and regional impacts are considered.

### North Slope Borough Comprehensive Plan Goals

- **Goal 1:** Cooperate with landowners and land managers to update land use regulations consistent with village priorities.
- **Goal 2:** Maximize opportunities by encouraging self-determination.
- **Goal 3:** Develop a housing program to address dilapidated infrastructure and housing shortage.
- **Goal 4:** Improve transportation between North Slope communities
- **Goal 5:** Protect the Iñupiaq language and subsistence culture.
- **Goal 6:** Develop strong, resilient local, and regional economies.
- **Goal 7:** Provide essential public infrastructure and services.
- **Goal 8:** Partner and collaborate with Industry for the benefit of borough residents.
- **Goal 9:** Attain energy independence and energy security.
- **Goal 10:** Protect our environment.
- **Goal 11:** Increase education and employment opportunities for all residents.
- **Goal 12:** Improve and consolidate social services.
- **Goal 13:** Ensure government efficiency and accountability.

The North Slope Borough Area of Influence is illustrated in Map 3.

### Comprehensive Plan Scope

After extensive collaboration with the North Slope Borough administration, directors, and deputy directors as well as village and regional leaders, 13 goals have been developed that provide the overall direction for the plan’s implementation. Objectives for each of these goals and associated strategies are included in Chapter 16.
This Plan is designed so that readers may focus on a specific section(s) of interest without having to read the plan in its entirety. Chapters 4 through 15 provide introductory material and a context for the goals, objectives, and strategies, which are included in Chapter 16 along with a discussion of plan implementation. The references at the end of the plan identify studies, reports, and other sources of information used in developing this plan. The 16 chapters of the plan and appendices are organized as follows:

- **Chapter 1: History, Culture, and Government.** This chapter provides background for the plan, including an overview of the region’s history, culture, and management authority.

- **Chapter 2: Comprehensive Planning Background.** Chapter 2 includes the purpose and history of planning in the North Slope, including a discussion of recently developed village comprehensive plans. The chapter also includes information on the public involvement for this plan.

- **Chapter 3: Vision 2039.** The vision statement provides the foundation for this plan and is found in Chapter 3.

- **Chapter 4: Population.** Chapter 4 provides an overview of the North Slope Borough population, including historical counts, reasons for population increases or decreases, and low and high population projections.

- **Chapter 5: Natural Environment.** A discussion of the North Slope geography, climate, vegetation, and wildlife are the focus of this chapter.

- **Chapter 6: Subsistence.** This chapter on subsistence includes maps on each community’s area of influence as well as the borough area of influence. It also includes a discussion on the importance of subsistence activities to the residents other North Slope, along with subsistence vulnerabilities and subsistence management.

- **Chapter 7: Public Facilities.** This chapter provides an overview of the North Slope Borough capital program as well as information on the services that the borough provides to its residents.

- **Chapter 8: Service Area 10.** This chapter provides details on services and facilities provided to the oil industry in the Prudhoe Bay region.

- **Chapter 9: Transportation.** The transportation chapter examines the modes of transportation in the North Slope, including air, surface, and marine.

- **Chapter 10: Energy.** The chapter on energy provides a discussion on increasing energy efficiency as well as an overview of alternative energy sources in the region.
• **Chapter 11: Housing.** This chapter contains housing background information and projected housing needs over twenty year planning horizon.

• **Chapter 12: Education.** The education chapter contains information on student reenrollment, the cultural learning framework used by the North Slope Borough School District, higher education available through Ilisaġvik College, and future education facility needs.

• **Chapter 13: Economy and Economic Development.** Chapter 13 contains a discussion of the economy of the North Slope, cost of living, economic opportunities, and oil and gas development.

• **Chapter 14: Health and Safety.** This chapter includes an overview of health, emergency services, natural disaster preparedness, contaminated sites, and spill response.

• **Chapter 15: Land Use and Land Management.** Municipal entitlements, zoning and other land use regulations, land management and other planning efforts, and current and future land use are provided in this chapter.

• **Chapter 16: Goals, Objectives, and Strategies.** This concluding chapter contains both the goals, objectives, and strategies for implementing this plan as well as a discussion on updating and future plan revisions.

• **Appendices.** The appendices provide additional information that may be useful to some readers, including details of public facilities by village, adaptation strategies for climate change impacts, the NSB Planning Commission resolution of plan support, and the NSB Assembly ordinance adopting this plan.
PART | CHAPTER 2: COMPREHENSIVE PLANNING BACKGROUND

Areawide Comprehensive Plan 2019—2039

North Slope Borough
Area of Influence – Map 3

NORTH SLOPE BOROUGH
NORTHWEST ARCTIC BOROUGH

Point Hope
Point Lay
Wainwright
Algasuk
Utqiagvik
Hanna Shoal

Chukchi Sea

0 15 30 45 60 75 90 Miles
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CHAPTER 3: VISION 2039

Developing a vision statement is an essential step in the comprehensive planning process. Vision statements focus on the region’s values, sense of identity, and aspirations. The vision statement tells both the community’s story while also painting a picture of an ideal future. Goals, objectives, and implementing strategies are developed to implement the vision that North Slope residents want for the future of the region.

The following vision statement has been created by borough leadership and is based on resident comments and concerns expressed during the comprehensive planning process as well as input received during the development of this plan. This statement guided the development of the goals and objectives that implement this plan.

VISION STATEMENT

With a strong sense of self determination and the guiding principle of “maximum local government” guaranteed by our State Constitution, we will rediscover our founder’s vision for this Home Rule Borough.

We will continue to embrace and value a strong sense of community through an active subsistence lifestyle that respects traditional wisdom and Iñupiat Values, while we welcome new technological advancements and contemporary knowledge.

We will guide regional development in a coordinated, cost effective, efficient, and environmentally responsible manner.

We will lift up and celebrate each community’s historical significance, wildlife habitats, clean air and water, and be responsible stewards of our abundant natural resources.


Nunaamaqqiqtigiñiqput suañaruaq sivunmun iligigutiniqagikput anusiañiştikit siiqisiqiligik taimanña-qaña isumattutivut suli łuđiawglutu piqpaqiravut, akutuqigñikala naatut savałguitit suli pagmapak iłitchubianiktavut.

Ilgigutiniqagikput nauninña nunapta avanmuni savaqatigiigluta, manikuñinña qaunagilugu, suli maqurrutaunianñachukan nunamun.

Qutchiñiniaqivut suli quviasuutiqiligik nunaaqqiqiilasm taimanña-qaan naumaruaqiqiññi, niqgtiñinña iniqiñ, sułamaquniq siiqisañiq suli salumarusamik siiqisañiq suli qaunagilluatañligik iñugiaqtut nunapta umialguñiñiñ.
We will endeavor to improve transportation systems and connectivity between villages and the rest of the State for the economic benefit of our residents.

We must invest in and maintain reliable utilities, public infrastructure and community facilities in order to ensure quality essential services to all residents for perpetuity.

There must be quality affordable rental and home ownership opportunities and upgrades to existing homes for all income levels to alleviate overcrowding and improve living conditions in this region. The Borough accepts a leadership role in providing solutions.

Our education systems will prepare our youth and adults through training opportunities and programs tailored to meet the employment needs of this region first.

Our government will promote healthy lifestyles, recognize service to community and inspire our children and adults to be thoughtful and well-informed and accept the responsibility for our future.

We will strive for unity through more transparency in government, more education on the issues important to our region. We will participate as individuals; listening and communicating; engaging our youth and our elders; plan for our future and adapt to change when we need to, together.

Iglīgvivut sulı qaqsaurakun atautchimiirrutivut nunaaqqiqiiaaptinniñ allanun ininun State-mi, nutaqsaqñiiaqivut anniqsuutrausafaqligut iñuuniagñiniñiñ iñuut iñuuniaptinni.

Manniqsuaskaqigivut sulı qaunagulluataqutksaraqigivut taimunça atuqumñiñaqsilugit anniqsuutrauraqut iñuuniagñiaptinni tapuutilugit nappañarut surağagviñiñ nunaaqqiiaaptinni.

Iglulluataqutksaraqutugut nutaanik atuqumñiñaqtapuntiñ akiliñ.aliñiyaqit tatqiñ tikiiñaakpan naakka iñuunaa qakliñiliqutugut nanmiñiq pigiliutilugut; sulı nutaksautqiñaqutksaraqutugut napaaniñtañtan iñunun qanutupayaaq akiññaktaaqaquuqgaluqapan iñuun, iñuñiñakpiñiq iglumñi palaññaqtaxaqsaglugut nunaaaptinni. Borough-m akuqtuavigatga taaptumununa savaksaqat.

Iliisaqvipta itqanaiyautiniñiñ nutaqqalkiñitqanaiq iñuunaaqitaqulugit sulı itqanaiqsinuitñiñ ilisaaksrañik tunaaqilugut savannagniq maani.

Kavamapti sivunmuktaaqñiñiñ anniqsuutrauran akun timiptiñun iñuuniaqiqiñ, nangqñaqñiñiñ anniqsuutrauraq nunaqqiqiñiñi sulı kiiqsrumqñaqñi aqtaqñallu qaqtqiññarualu isumlaaqqulugut sulı ilitchuqiluataqulugut sulı aqtaqulluataqulugut quanuq iglīgniaqniksruna iñuuniangnita taimunça.

Atautchikuagñiagtiqutugut kavamaptiñun sunapayaaq ilitatingulugut iñuuniaqgamun, uqausiqgiltuqñiñiñ suqtauruqtaq sulı nuimanaqtuq nunaaptinni. İñułlaagulugut piqtauniaqtiqutugut, naalagniñuluq sulı uqaqatigiñijutugut, taputuqulugit nutaqqallu utuqqanaallu; sulı sivuniqatigiñiñulugut iñuuniagviksaraptiñun, suna allanuqtiqtsraukpan alallnulaluluq iñuuniaqglugut.
Part II: North Slope Borough Today
Chapter Four
Population
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CHAPTER 4: POPULATION

The population across the North Slope Borough has experienced an overall increase since population estimates were initiated in 1880. The North Slope has a very young population, with average ages below the state and national averages. The population increase influences the need for transportation facilities, housing, healthcare, education, subsistence resources, employment, and public services.

While the borough population is predominately comprised of Iñupiat Eskimos, the population is diverse. This regional plan reflects the issues and goals of the local people. The development of the plan was focused on twelve traditional Iñupiat values, found in Table 2, which are widely shared principles embraced by the many cultures represented on the North Slope.

While the federal and state governments provide estimated population counts and socioeconomic data, since the 1980s, the North Slope Borough has been conducting an independent census and socioeconomic research that includes issues important to North Slope residents, such as subsistence activities and use of the Iñupiaq language. The most recent census was conducted in 2015. Topics addressed include: population, employment, income, housing, education, subsistence, and other community indices. The following section provides an overview of socioeconomic characteristics. The NSB censuses are the primary source for the information in this chapter, supplemented by state and federal socioeconomic data.

HISTORICAL POPULATION AND POPULATION TRENDS

The North Slope Borough is comprised of 94,762 square miles, with an estimated 2017 population of 8,356 residents. The borough’s population density is one resident for every 19.6 square miles. While the resident population is primarily concentrated in the borough seat of government of Utqiaġvik, hundreds of residents live in each village.

Historical Population

The U.S. decennial census provides data on some settlements within the current North Slope Borough boundary as far back as 1880, when there was approximately 1,198 residents. The U.S. decennial censuses for the North Slope region have varied greatly; some decade counts included numerous areas within the North Slope region, like 1890, while other decennial counts only included several of the more established settlements, such as the 1900 decennial census.

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51 The total does not include approximately 2,174 people that work in the Prudhoe Bay region and are not permanent residents or the 427 other outside persons that are considered to live outside the communities. These figures are from the Alaska Department of Labor and Workforce Development, Research & Analysis Section. From the North Slope Borough. 2015. North Slope Borough 2015 Economic Profile and Census Report Volume XI. Prepared by Circumpolar Research Associates Shepro, C., Maas, C. and D. Gallaway and edited by Jason Bergerson for the North Slope Borough. www.north-slope.org/your-government/nsb-2015-economic-profile-census-report.
Some years included population counts for some villages, only to disappear for decade. Such is the case for Point Lay, whose population was 77 in 1890. Yet the census did not include Point Lay again for another fifty years, when the population was estimated at 117 in 1940. Some areas, like most of those from 1880, and many from subsequent years, like Sea Horse Island in 1980, and Cross Island, Demarcation Point, and others in 1940, are only counted once and never reappear. Although the North Slope census count was sporadic a century ago, today the borough spends a significant amount of both time and money in ensuring correct population counts.

The North Slope Borough population has increased for every U.S. decennial census year since 1940, as shown in Table 6. Figure 8 provides an illustration of the population increases from 1940. The number of residents in any community can vary seasonally; subsistence activities may take residents out the community for weeks at a time and some teachers at the North Slope Borough School District and their families may live elsewhere during the summer months.

Table 6: NSB Decennial Census, 1880 - 2010

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
<th>Source</th>
<th>Census Areas</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td>1,198</td>
<td>U.S. Decennial Census</td>
<td>Tikizat, Ip Not, Tikirak, Cape Dyer, Cape Lisburne, Point Lay, Otokok, Kolumatourok, Noonaagemute, Ootkaiovik, Pinoshuragin, Ootiwakh, Refuge Inlet, Lolmullit, Colville River</td>
</tr>
<tr>
<td>1890</td>
<td>1,028</td>
<td>U.S. Decennial Census</td>
<td>Cape Smyth, Icy Cape, Point Barrow, Point Belcher, Point Hope, Point Lay, Sea Horse Island, Wainwright Inlet</td>
</tr>
<tr>
<td>1900</td>
<td>937</td>
<td>U.S. Decennial Census</td>
<td>Cape Smythe settlement, Point Hope village</td>
</tr>
<tr>
<td>1910</td>
<td>816</td>
<td>U.S. Decennial Census</td>
<td>Barrow village, Point Barrow, Point Hope</td>
</tr>
<tr>
<td>1920</td>
<td>997</td>
<td>U.S. Decennial Census</td>
<td>Barrow district (including Barrow, Point Barrow, and Wainwright villages), Point Hope District, including Tigara village</td>
</tr>
<tr>
<td>1930</td>
<td>409</td>
<td>U.S. Decennial Census</td>
<td>Point Barrow village, Tigara village, Wainwright village</td>
</tr>
<tr>
<td>1940</td>
<td>1,516</td>
<td>U.S. Decennial Census</td>
<td>Barrow village, Beard Bay, Brower village, Cape Halkett village, Coleville River, Harrison Bay, Kalovik, Killik River, Meade River, Olektak, Point Barrow village, Point Lay village, Tigara (Point Hope) village, Wainwright village, Cross Island, Demarcation Point, Humphry Point, Konganek Point, Martin Point, Tigvariak Island</td>
</tr>
<tr>
<td>1950</td>
<td>1,678</td>
<td>U.S. Decennial Census</td>
<td>Anaktuvuk Pass village, Barrow village, Point Hope village, Point Lay village, Wainwright village, Kaktovik village, Tikiluk village</td>
</tr>
<tr>
<td>1960</td>
<td>2,101</td>
<td>U.S. Decennial Census</td>
<td>Anaktuvuk Pass, Barrow, Barter Island, Meade River, Point Hope, Wainwright</td>
</tr>
<tr>
<td>1970</td>
<td>3,027</td>
<td>U.S. Decennial Census</td>
<td>Anaktuvuk Pass city, Barrow city, Kaktovik, Point Hope city, Wainwright city</td>
</tr>
<tr>
<td>1980</td>
<td>4,199</td>
<td>U.S. Decennial Census</td>
<td>North Slope Borough</td>
</tr>
<tr>
<td>1990</td>
<td>5,979</td>
<td>U.S. Decennial Census</td>
<td>North Slope Borough</td>
</tr>
<tr>
<td>2000</td>
<td>7,385</td>
<td>U.S. Decennial Census</td>
<td>North Slope Borough</td>
</tr>
<tr>
<td>2010*</td>
<td>9,430</td>
<td>U.S. Decennial Census</td>
<td>North Slope Borough</td>
</tr>
</tbody>
</table>

* The 2010 U.S. Decennial Census includes the estimated industrial center Prudhoe Bay non-resident workforce of 2,174 people.
Table 7: NSB Census Population Estimates, 1993 - 2015\textsuperscript{52, 53, 54}

<table>
<thead>
<tr>
<th>Year</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1993</td>
<td>6,538</td>
</tr>
<tr>
<td>1998</td>
<td>7,555</td>
</tr>
<tr>
<td>2003</td>
<td>7,307</td>
</tr>
<tr>
<td>2010</td>
<td>7,998</td>
</tr>
<tr>
<td>2015</td>
<td>8,075</td>
</tr>
</tbody>
</table>

Figure 8: North Slope Borough Population, 1940 - 2017\textsuperscript{55}

The population dynamics of North Slope Borough communities have undergone significant change since 2003 (a NSB census year), and especially between 2010 and 2015. There were also some significant changes in the population’s ethnic composition between 2003 and 2015. In 2003, Iñupiat residents accounted for 74.1 percent of the total North Slope...
population. In 2010, the percentage of Iñupiat residents increased to 76.4. However, just five years later, the percentage of Iñupiat residents increased nearly 6 percent from 2003 to 80 percent while the percentage of non-Iñupiat dropped significantly. These ethnic composition changes have occurred primarily in Utqiaġvik; North Slope village populations have remained at levels where Iñupiat comprise between 88 and 94 percent of the population. In Utqiaġvik, the population change was an increase from 59 percent Iñupiat in 2003 to 70 percent in 2015, with a corresponding drop from 21 percent Caucasian in 2003 to 12 percent in 2015.56

An exodus of some segments of the population, particularly Caucasians and other non-Iñupiat residents, accounts for much of the recent ethnic changes.57 Much of the ethnic composition change can be attributed to economic downturns; the recession in Alaska and decline of oil prices worldwide have caused slowdowns in oil field production on the North Slope. Workforce layoffs, facilities’ shutdown, and spending declines by industry have had their affect in the North Slope and all of Alaska. The state’s economic health has declined, putting further pressure on the North Slope economy in terms of declining support for essential services.58

Forecasting Trends

The student population of the North Slope Borough School District appears to be rebounding from earlier declines. While the numbers of students enrolled have been increasing in all schools with the exception of Meade River School in Atqasuk, they have yet to equal those recorded in the 1999 - 2000 school year. More detail on this issue is to be found in Chapter 12, Education. The increase in the school age population is a positive sign of growth for the North Slope region’s population. It also can have a less than positive affect on the economy for the region. In 2015, the 0 - 15 age cohort grew at a full three percent. At the same time, the 16 - 64 age cohort, the current and projected labor force, declined by 3.8 percent. The population 65 years of age and over grew by 0.6 percent, shown in Figure 9. The result of these shifts is a change in the dependency ratios. This shift indicates that more resources and funding will need to go toward both education and senior services, while the labor force and the economy are shrinking to support those investments is in decline.59

Additional teachers and educational facility space will be needed to educate a larger number of students. Daycares, already needed in all communities, will become even more in demand. Additional recreation and social spaces, such as community centers, are already sought in every community. An increasing youth population will exacerbate the need for a place where kids can socialize with their peers. The elderly population will also need additional senior housing and services as well as health care facilities.

57 Ibid
58 Ibid
59 Ibid
Table 8: Dependency Ratios 2003, 2010, and 2015

<table>
<thead>
<tr>
<th>Age Cohorts</th>
<th>2015</th>
<th>2010</th>
<th>2003</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-15</td>
<td>33.1%</td>
<td>30.1%</td>
<td>31.4%</td>
</tr>
<tr>
<td>0-18</td>
<td>37.2%</td>
<td>35.8%</td>
<td>N/A</td>
</tr>
<tr>
<td>18-24</td>
<td>11.4%</td>
<td>13.6%</td>
<td>N/A</td>
</tr>
<tr>
<td>55-64</td>
<td>9.9%</td>
<td>9.3%</td>
<td>5.7%</td>
</tr>
<tr>
<td>62+</td>
<td>8.6%</td>
<td>5.6%</td>
<td>N/A</td>
</tr>
<tr>
<td>65+</td>
<td>6.4%</td>
<td>5.8%</td>
<td>5.6%</td>
</tr>
<tr>
<td>16-64</td>
<td>60.3%</td>
<td>64.1%</td>
<td>63.0%</td>
</tr>
<tr>
<td>18-64</td>
<td>57.6%</td>
<td>60.3%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Youth Dependency Ratio 54.8% 46.9% 49.8%
Age Dependency Ratio 10.4% 8.4% 8.8%
Total Dependency Ratio 65.2% 53.3% 58.6%

Figure 9: 2015 Population Pyramid


Ibid
Includes only those individuals responding to the survey.
POPULATION INCREASE

The U.S. and NSB censuses do not collect data on new residents or current residents moving out of the village or borough, also known as resident in-migration and out-migration. Out-migration is often attributed to high school graduates leaving to attend college, workers seeking employment opportunities elsewhere, or residents leaving to be close to other family members or loved ones. In-migration would most often be attributed to new residents moving to the village to live with or near family members or for employment.

One potential indicator of the prevalence of in-and out-migration may be the number of people who apply for the annual Alaska Permanent Fund Dividend (PFD). The Permanent Fund program tracks the dividend recipients by zip code and community. Figure 10 illustrates the combined number of adult and child applicants for the PFD program living in the North Slope Borough between 2000 and 2015. Over the period from 2000 through 2015, the highest combined total of PFD applicants was in 2000 at 6,981, 404 people less than the U.S. Decennial Census for the same year. The year with the least applications submitted by both child and adult residents was in 2005, at 6,263.

The State of Alaska uses PFD applications in conjunction with birth and death data and the U.S. Census to determine the population of a community. The number of PFD applications does not always provide an accurate portrayal of a community’s population, leading to an undercount of the existing population and thus to an estimate that is not reflective of the actual population in the community. Some of the issues with using the PFD as an indicator of in-and out-migration can be problematic. There are number of reasons an Alaska resident would choose not to apply for PFD dividend, including:

- Retain residency in another state;
- Consider the PFD investments unethical;
- Consider it a bribe by oil companies that are buying approval / silence;
- Too much pride / already receive free health care and other dividends;
- In the military;
- Avoid jury duty or other obligations;
- PFD would be garnished by the state for unpaid child support or other liens.

The strongest component of population growth is natural increase, with more births occurring than deaths. Between 2010 and 2015, 922 residents were born and 231 persons passed away, for a net increase of 691 people living throughout the borough. As shown in Table 9, births and deaths have been fairly constant over the six-year period. Every year births have exceeded deaths.

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63 The PFD annual reports for 2016 and 2017 did not include applicants by location.
Figure 10: PFD Applicants, 2000 - 2015

Table 9: Components of Population Change, 2010 to 2015

<table>
<thead>
<tr>
<th>Period (July-based)</th>
<th>End of Period Population</th>
<th>Population Change</th>
<th>Growth Rate</th>
<th>Births</th>
<th>Deaths</th>
<th>Natural Increase</th>
<th>Net Migration</th>
</tr>
</thead>
<tbody>
<tr>
<td>April 2010-July 2010</td>
<td>9,476</td>
<td>46</td>
<td>1.95%</td>
<td>44</td>
<td>14</td>
<td>30</td>
<td>16</td>
</tr>
<tr>
<td>2010-11</td>
<td>9,584</td>
<td>108</td>
<td>1.13%</td>
<td>177</td>
<td>42</td>
<td>135</td>
<td>-27</td>
</tr>
<tr>
<td>2011-12</td>
<td>9,715</td>
<td>131</td>
<td>1.36%</td>
<td>176</td>
<td>34</td>
<td>142</td>
<td>-11</td>
</tr>
<tr>
<td>2012-13</td>
<td>9,876</td>
<td>161</td>
<td>1.64%</td>
<td>178</td>
<td>49</td>
<td>129</td>
<td>32</td>
</tr>
<tr>
<td>2013-14</td>
<td>9,739</td>
<td>-137</td>
<td>-1.40%</td>
<td>174</td>
<td>47</td>
<td>127</td>
<td>-264</td>
</tr>
<tr>
<td>2014-15</td>
<td>9,895</td>
<td>156</td>
<td>1.59%</td>
<td>173</td>
<td>45</td>
<td>128</td>
<td>28</td>
</tr>
</tbody>
</table>

68 The 2010 PFD Annual Report was missing applicant figures for Point Hope. The 2015 PFD Annual Report did not provide child applicants and adult applicants separately.
PRUDHOE BAY WORKERS

Virtually no one lives in the Prudhoe Bay area year-round. It is not a community as is typically understood throughout the U.S. The center of activity in Prudhoe Bay is Deadhorse. The airport, hotels, and a store are all located in Deadhorse. However, there are not retail stores, homes, or apartment buildings. Workers travel to the area for rotational shifts – often several weeks on and several weeks off. The workers travel to Prudhoe Bay from within Alaska and the lower 48. Counting permanent residents is difficult in an area without permanent homes. The U.S. Census relies on self-reporting. Many Prudhoe Bay workers staying in group quarters reported it was their “usual residence” in 2010, though almost none did in the previous census. As a result, Prudhoe Bay, which the census gave a population of 5 in 2000, had 2,174 reported residents in 2010.70

While Prudhoe Bay employment grew considerably between 2000 and 2015, as shown in Figure 11, there is no evidence that workers have established permanent residences in the area. The increase should be considered a statistical anomaly rather than true population growth.71

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71 Ibid
POPULATION GROWTH PROJECTIONS

Determining population estimates for small communities in rural Alaska is problematic, even though both the U.S. Census Bureau and the State of Alaska calculate them annually. According to the 2015 North Slope Borough Census, the problem with the rural Alaska population estimates is, in part, because the U.S. Decennial Census is an estimate based on a combination of surveys and administrative reports. The U.S. Census reported that for the 2010 Decennial Census “approximately 74 percent of the households returned their census forms by mail; the remaining households were counted by census workers walking neighborhoods throughout the United States.”

While the U.S. Census does conduct door-to-door counts, rural Alaskan villages are difficult to reach, accommodations are often non-existent, and weather conditions make walking throughout the community difficult, questioning the effectiveness of this method in these communities. The 2015 NSB Census also considers the survey return rate for rural Alaskan communities. Seventy-four percent is a national return rate. These issues may lead to chronic undercounting and/or inaccurate Census data for population and/or employment.

The State of Alaska uses a combination of trend lines based on the prior U.S. Decennial Census as well as Permanent Funds Dividend applications, birth and death rates, and migration to complete population estimates. As noted earlier in this chapter, there are many reasons that an Alaska resident may not submit a PFD application. The lack of personal contact with rural residents may also contribute to undercounting.

The State of Alaska population projections for the North Slope Borough are higher than projected in this plan because they include the Prudhoe Bay workforce coupled with a 2010 census of fewer residents than determined by the NSB Census results in a projected population that has perpetuated these differences.

Because population projections for Alaska’s rural communities are difficult, most of the village comprehensive plans present population projections on annual percentage growth or contraction as well as a linear trend method. The linear trend projection assumes that a village’s population will increase or decrease by the same number of people in each future decade as the average per decade increase or decrease observed during the specific interval, for example, between 1980 and 2010. The plans that provide the linear trend method all indicate that future growth falls well within the range for modest growth. This relatively simple method of projecting the future population is often as accurate as more complex methods, but as previously discussed, has limitations for small and rural communities. Ideally, the population estimates used for the linear trend would be North Slope Borough Census population estimates.

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75 Ibid
estimates instead of U.S. Decennial Census estimates because of the imprecise nature of the latter. However, given that the NSB Census has not been undertaken for as many years to show trends over longer periods, the linear projection in the village plans utilize the U.S. Decennial Census. Because not all the NSB plans have been updated with a consistent linear trend population project, the population projections included in tables 10 and 11 are estimated at a one percent and one-half percent growth rates annually. One percent growth represents the largest growth rate of the adopted village comprehensive plans (that use this method). Because the one percent growth rate results in the largest population estimate for the planning horizons, these figures were also used to calculate public infrastructure capacity. The exception for the population project in this areawide plan is Utqiagvik, whose high growth rate is used as nine new residents per month over the planning horizon, shown in Table 10. Table 11 shows a lower growth rate at one-half percent, with Utqiagvik gaining four residents per month.

Table 10: High Growth Population Projections, Five, Ten, and Twenty Years

<table>
<thead>
<tr>
<th>Village</th>
<th>Population Projection Year</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2035</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td></td>
<td>393</td>
<td>413</td>
<td>434</td>
<td>480</td>
</tr>
<tr>
<td>Atqasuk</td>
<td></td>
<td>248</td>
<td>261</td>
<td>274</td>
<td>393</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td></td>
<td>449</td>
<td>472</td>
<td>496</td>
<td>548</td>
</tr>
<tr>
<td>Kaktovik</td>
<td></td>
<td>262</td>
<td>275</td>
<td>289</td>
<td>320</td>
</tr>
<tr>
<td>Point Hope</td>
<td></td>
<td>711</td>
<td>747</td>
<td>785</td>
<td>866</td>
</tr>
<tr>
<td>Point Lay</td>
<td></td>
<td>269</td>
<td>283</td>
<td>297</td>
<td>328</td>
</tr>
<tr>
<td>Utqiagvik</td>
<td></td>
<td>4,825</td>
<td>5,365</td>
<td>5,905</td>
<td>6,985</td>
</tr>
<tr>
<td>Total**</td>
<td></td>
<td>7,707</td>
<td>8,394</td>
<td>9,088</td>
<td>10,593</td>
</tr>
</tbody>
</table>

*Village population projects use a one percent growth rate. Utqiagvik assumes an increase of nine residents per month based on previous growth rates.

**2015 total differs from census total because census is the estimated population based on counts while the 2015 figures used in the projection are DCCED certified population estimates.

Table 11: Low Growth Population Projections, Five, Ten, and Twenty Years

<table>
<thead>
<tr>
<th>Village</th>
<th>Population Projection Year</th>
<th>2015</th>
<th>2020</th>
<th>2025</th>
<th>2035</th>
</tr>
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<tbody>
<tr>
<td>Anaktuvuk Pass</td>
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<tr>
<td>Atqasuk</td>
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<td>261</td>
<td>274</td>
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<tr>
<td>Nuiqsut</td>
<td></td>
<td>449</td>
<td>460</td>
<td>472</td>
<td>496</td>
</tr>
<tr>
<td>Kaktovik</td>
<td></td>
<td>262</td>
<td>269</td>
<td>275</td>
<td>289</td>
</tr>
<tr>
<td>Point Hope</td>
<td></td>
<td>711</td>
<td>729</td>
<td>747</td>
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<tr>
<td>Point Lay</td>
<td></td>
<td>269</td>
<td>276</td>
<td>283</td>
<td>297</td>
</tr>
<tr>
<td>Utqiagvik</td>
<td></td>
<td>4,825</td>
<td>5,065</td>
<td>5,305</td>
<td>5,785</td>
</tr>
<tr>
<td>Wainwright</td>
<td></td>
<td>550</td>
<td>564</td>
<td>578</td>
<td>608</td>
</tr>
<tr>
<td>Total**</td>
<td></td>
<td>7,707</td>
<td>8,020</td>
<td>8,334</td>
<td>8,969</td>
</tr>
</tbody>
</table>

*Village population projects use a half percent growth rate. Utqiagvik assumes an increase of four residents per month.

**2015 total differs from census total because census is the estimated population based on counts while the 2015 figures used in the projection are DCCED certified population estimates.
COMMUNITY INPUT, FINDINGS, NEEDS, AND CHALLENGES

During the public input process, residents did not discuss population dynamics. While population dynamics play a large role in determining services and programs for current and future residents, these issues are included in other areas of this plan, namely health care, education, and economic development.

**Findings**

*The NSB population has increased for every U.S. decennial census year since 1940.*

*The number of residents in any community can vary seasonally; subsistence activities may take residents out the community for weeks at a time and some teachers at the North Slope Borough School District and their families may live elsewhere during the summer months.*

*While the U.S. Census does conduct door-to-door counts, rural Alaskan villages are difficult to reach: overnight accommodations are often not available and weather conditions make walking throughout the community difficult.*

*The number and percentage of young people and elderly are increasing.*

*Not all Alaska residents submit PFD applications that are used for estimating populations.*

*Prudhoe Bay workers travel from within Alaska and the lower 48 to rotational jobs on the North Slope.*

**Needs & Challenges**

*The state and federal censuses do not accurately reflect the number of people living in the North Slope Borough.*

*Providing financial resources for the services and programs targeting the growing youth and elderly populations – including daycares, senior housing, and recreational spaces for teens will be needed.*

*Counting permanent residents is difficult in the Prudhoe Bay region, an area without permanent homes. Censuses rely on self-reporting.*

*A lack of personal contact with rural residents and relying on PFD applications may contribute to undercounting rural populations.*

*Calculating population projections for small communities can be difficult; small changes can make a big impact on the projected number of residents.*
Chapter Five
Natural Environment
CHAPTER 5: NATURAL ENVIRONMENT

GEOGRAPHY

The North Slope Borough is situated on the Arctic Coastal Plain of Alaska, bound by the Brooks Mountain Range to the south and the Chukchi and Beaufort Seas to the west and north. The Arctic Coastal Plain is a gently rolling, treeless landscape characterized by a wide expanse of flat tundra with thaw lakes, drained lake basins, polygonal patterned ground, pingos, and tussock-laden tundra overlaying permafrost.77, 78

The NSB encompasses an area of nearly 95,000 square miles, across which eight rural communities are dispersed. The majority of these communities are coastal on the Beaufort or Chukchi seas, with only one community being more than 30 miles from a coastline, Anaktuvuk Pass.79 Freshwater lakes, streams, and rivers are abundant in the region and support a variety of wildlife.

Some rivers within the NSB have been designated by the U.S. Congress to be Wild and Scenic Rivers, including the Sheenjek, Ivishak, and Wind rivers. The intent of the designation is to safeguard rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations.80

VEGETATION AND WETLANDS

Low shrubs, mosses, sedges and lichens cover the North Slope of Alaska.81 Arctic Tundra receives little precipitation, but wetlands are abundant due to the impermeable layer of permafrost under the thin tundra soil.82 Wetlands in the NSB are primarily freshwater emergent wetlands, a grouping which includes wet meadows, marshes, swamps, or bogs, where standing surface water and ice provide habitat for plants that reach through the water to reach air.83

Arctic wetlands provide many useful functions and values. The various ponds, lakes, and drainages of the North Slope regulate runoff through storage in the active layer, slowly releasing water to streams over extended periods. These wetlands retain or distribute sediments, nutrients, and toxicants. When planning future development, careful siting can minimize impacts to higher value wetland areas, where disruptions may adversely affect the habitat of sensitive and important wildlife species, or functions benefitting the community.

SOILS/ GEOLOGY

Soils in the North Slope Borough are typical of the Arctic Coastal Plain and include fine-grained, organic-rich silt and some sand which has been deposited by rivers. These soils are topped by a thin, peaty tundra mat which supports a variety of vegetation. Surficial geological deposits of coal, marine sand, and bedrock also dot the landscape. Outcroppings of coal have been found in or near the communities of Atqasuk, Point Lay, Nuiqsut, Point Hope, and Anaktuvuk Pass. The NSB’s distinctive rolling tundra is formed over a continuous region of deep permafrost.

Permafrost

Permafrost is defined as ground (soil or rock and included ice or organic material) that remains at or below 0°C for at least two consecutive years. Thick, continuous permafrost generally exists north of Kotzebue Sound. In permafrost regions, the uppermost layer of soil that freezes and thaws seasonally is the active layer. The highest moisture content can be found in the active layer. Below the active layer lies the permafrost table; the highest moisture content in the permafrost tends to be found in this layer.

Freeze-thaw cycles of permafrost create polygonal ground patterns which are separated by ice wedges. Also present among soils on the North Slope of Alaska are ice lenses, localized ice formations that often melt at a different rate than the surrounding soil. Coastal bluffs experiencing erosion expose permafrost soils and ice wedges, which are vulnerable to thermal degradation (melting). Climate change accelerates erosion and melting, increasing water movement.

Climate

The climate in the Alaskan Arctic is affected by many factors including atmospheric pressure, temperature, geography, wind, humidity, clouds, and precipitation. A tundra climate prevails on the North Slope, with cool and cloudy summers and long cold winters.

Temperatures are moderated by surrounding topography and proximity to marine waters. Flat and treeless tundra means no natural wind barriers or protected valleys where dense cold air can settle as commonly happens in interior Alaska. The average temperature for the year on the North Slope is 25.0°F (-3.9°C). The warmest month, on average, is July with an average temperature of 60.5°F (15.8°C). Freezing temperatures can occur at any time of year, but the coolest month on average is January, with an average temperature of -13.7°F (-25.6°C).
average temperature of -8.5°F (-22.5°C). Inland communities such as Anaktuvuk Pass are influenced by the interior Arctic climate, and register warmer in the summer and cooler in the winter than other coastal communities within the NSB.

The average amount of precipitation for the year is 13.0" (330.2 mm) on Alaska’s North Slope. The month with the most precipitation on average is August with 2.4" (61 mm) of precipitation. Winter precipitation generally consists of dry snow, with an average of 46.2" of snow (0 cm). The month with the most snow is October, with 9.2" of snow (23.4 cm).92 Many communities within the NSB experience persistent high winds, which can cause issues with snow drifting around infrastructure and melting issues during breakup.93 Inversions are also common in the Arctic, when cold air settles close to the ground with warm air on top of it.

Air Quality

According to ADEC’s Air Quality Advisories/Episodes List, there has been only one air quality advisory on the North Slope since 2011.94 This was issued in July of 2017 due to migration of wildlife smoke from the northern Yukon Flats, and lasted for four days. No additional air quality warnings or episodes were issued from 2011 – 2018.

While air quality advisories on the North Slope have been minimal, rural communities do experience periods of decreased air quality. The 2012 Health Impact Assessment (HIA) notes that the Arctic has unique climate-related factors which can contribute to decreased air quality and increased levels of exposure to air pollution. For example, low temperatures increase incomplete combustion products and create temperature inversions, trapping pollution near homes and people. Residents of North Slope communities have voiced concern regarding airborne particulates from gravel roadways, particularly during strong wind events. These particulates can have negative effects on health, particularly to children and the elderly.95

Additionally, the Prudhoe Bay oilfield can impact air quality by diesel combustion and natural gas processing activities. Air quality changes due to development has primarily been voiced as a concern in Nuiqsut, the community closest to the Prudhoe Bay oilfield.96 A recent study published in Atmospheric Environment used air quality data collected in Utqiavik to find that Prudhoe Bay is a significant component of the tiny chemical particles suspended in the air.97 Additional air quality monitoring stations have been added as recently as 2016.98, 99

96 Ibid
Water Quality

The ADEC Alaska Monitoring and Assessment Program conducts aquatic resource surveys across Alaska to measure water quality based on a variety of indicators, including chemical contaminants, macroinvertebrate community structure, and water chemistry. A list of impaired waters is maintained by the ADEC. There are not any impaired water bodies within the NSB included in the ADEC Catalog. However, the Catalog has not been updated since 2010. Across the Northern Region, surveys have been completed on Arctic Wetlands (2011) and Arctic Lakes (2013), among other more targeted location surveys. Both surveys showed overall water quality as good. Waterbodies near human activity, contaminated sites, or other potential pollution sources may experience long-term or seasonal contamination, and need to be tested on an individual basis. Water quality testing is required for any drinking water source, and the ADEC Drinking Water Program ensures drinking water sources are compliant with state and federal drinking water regulations. More advanced testing techniques may identify newly recognized contaminants, which may be present in village water sources.

WILDLIFE

The North Slope Borough is abundant with wildlife. Migratory birds, land mammals, marine mammals, invertebrates, and fish find habitat in the lands and waters of northern Alaska, and provide subsistence resources to residents.

Migratory birds travel to coastal breeding areas in late March through early May where feeding, breeding, and nesting takes place in arctic bays, lagoons, and river outlets. For the duration of the brief summer, the North Slope is home to millions of birds, including seabirds, waterfowl, shorebirds, songbirds, and upland birds and raptors.

Wetland and upland habitats support land mammals including caribou, muskox, arctic and red fox, wolf, wolverine, arctic and ground squirrel, among many others. Land mammals are adapted to their arctic environments and have unique ways of dealing with the cold environment, such as migrating out of the arctic, conservation of energy or hibernation, and circulatory system adaptations.

There are four major caribou herds on the North Slope, including the Teshekpuk Lake Herd, Central Arctic Herd, Western Arctic Herd, and Porcupine Herd. These herds migrate between their southern winter grounds to northern

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coastal summer grounds to forage, calve, and for insect relief.\textsuperscript{105}

Marine mammals including the bowhead, beluga, and gray whale, ringed, bearded, and spotted seal, walrus, and polar bear are found in the waters and coastal environments of the Beaufort and Chukchi Seas. Marine mammals are highly important to the marine ecosystem and are valued for their vast subsistence resources. Food resources for marine mammals are varied and include fish, benthic invertebrates, and other marine mammals.\textsuperscript{106}

Fish, both marine and freshwater, inhabit Alaska’s North Slope. Fish commonly found in the Beaufort and Chukchi Seas include multiple species of cod, flounder, cisco, and whitefish, as well as sculpin, herring, and smelt.\textsuperscript{107} Additionally, many rivers which drain into the Chukchi or Beaufort Seas and their tributaries provide spawning and rearing habitat for anadromous fish species. Anadromous fish are fish which spend portions of their life cycle in both fresh and salt waters.\textsuperscript{108}

Protected Species

Wildlife species can be protected by many different agencies and regulations. Key regulations affecting NSB wildlife and use thereof are outlined in this section, however this is not an exhaustive list. Traditional Knowledge of wildlife populations growing or declining can influence protections taken by subsistence users. Hunting, trapping, and fishing regulations, as well as land ownership and special designation of lands may also apply.

All thirteen great whales, including bowhead, are protected by the International Whaling Commission. Bowhead hunts are regulated by a catch limit imposed by the IWC. The Commission estimates that subsistence hunts take less than one percent of the stock of bowhead whales per year.\textsuperscript{109} The Alaska Eskimo Whaling Commission (AEWC) advocates for subsistence whaling rights of Alaska Eskimos and the protection of habitat of the bowhead whale.

At the federal level, the Migratory Bird Treaty Act (MBTA) (1918), the Marine Mammal Protection Act (MMPA) (1972), and the Endangered Species Act (ESA) (1973) apply to certain and specific wildlife species found within the NSB. Species may experience protection under more than one federal regulation.

All native birds in Alaska except grouse and ptarmigan are federally protected under the MBTA, which prohibits the “take” of migratory birds, their feathers, or their nests. The exception is the Willow ptarmigan, which is protected as a species of least concern. “Take” means to harass, harm, pursue, hunt, shoot, wound, kill, capture, or collect, or to attempt to engage in any such conduct.\textsuperscript{110} In 1997, the U.S. Congress ratified treaty amendments that made

\begin{footnotesize}
\begin{itemize}
  \item \textsuperscript{108} State of Alaska. Department of Fish and Game. 2018. \textit{Anadromous Waters Catalog}. http://extra.sf.adfg.state.ak.us/FishResourceMonitor/?mode=awc.
\end{itemize}
\end{footnotesize}
it legal for residents of villages within subsistence harvest areas to take migratory waterfowl for subsistence during the traditional spring season. The amendments also required that a meaningful role be provided to Alaska Natives in the development and implementation of regulations affecting the non-wasteful taking of migratory birds, leading to the formation of the Alaska Migratory Bird Co-Management Council. Subsistence migratory bird regulations are now developed annually by the USFWS based on recommendations of the Alaska Migratory Bird Co-Management Council.\textsuperscript{111}

The MMPA protects all marine mammals, with jurisdiction shared between NOAA Fisheries (also known as the National Marine Fisheries Service or NMFS) for seals, sea lions, whales, dolphins, and porpoises, and the USFWS for sea otter, polar bear, and walrus.\textsuperscript{112} Like the MBTA, the MMPA makes it illegal to “take” marine mammals without a permit.\textsuperscript{113} The MMPA includes an exemption for Alaska Natives living on the coast of the North Pacific an exemption, which allows for the non-wasteful harvest of marine mammals for subsistence and for creating and selling handicrafts and clothing.\textsuperscript{114}

The ESA also prohibits “take” of listed species, but additionally restricts transportation and selling of listed species and their parts, prohibits federal activities which jeopardize their continued existence or adversely modifying their habitat, and mandates development and implementation of recovery plans.\textsuperscript{115} A species is considered endangered if in danger of extinction throughout all or a significant portion of its range, and considered threatened if likely to become endangered within the foreseeable future.\textsuperscript{116} The ESA includes an exemption for Alaska Natives which allows taking of listed species when the taking is primarily for subsistence purposes and it doesn’t negatively affect the listed species. Specific information regarding ESA-listed species within the NSB is included in the following section.

At the state level, the Alaska Department of Fish and Game (ADF&G) is the main entity involved with in wildlife protections. ADF&G maintains hunting, trapping, and fishing regulations for the entire State of Alaska. Additionally, ADF&G maintains the Catalog of Waters Important for the Spawning, Rearing, or Migration of Anadromous Fishes for the State of Alaska (the Catalog). Under Alaska Statute 16.05.871, listing in the Catalog requires ADFG approval should any agency or person wish to construct a hydraulic project or use, divert, obstruct, pollute, or change the natural flow or bed of listed rivers, or to use wheeled, tracked, or excavating equipment or log-dragging equipment in the bed of listed rivers.

Threatened and Endangered Species

The North Slope Borough Department of Wildlife Management facilitates sustainable harvests and monitors populations of fish and wildlife species through research, leadership, and advocacy from local to international levels. Additionally, the

\begin{footnotesize}
\begin{itemize}
\item[\textsuperscript{112}] Ibid
\end{itemize}
\end{footnotesize}
Department of Wildlife Management encourages borough resident participation in the management of wildlife resources by keeping the resources at healthy population levels, essential to successful subsistence harvests.117

The Endangered Species Act (1973) requires federal agencies work to conserve threatened and endangered species and the habitats on which they depend. The goal is to protect and recover imperiled species and their habitats. The NSB and surrounding waters provide habitat to eight species which are listed as threatened or endangered. The Pacific Walrus is currently a candidate for listing under the ESA, which means that the USFWS has sufficient information to propose them as threatened or endangered but development of the proposed listing is precluded due to higher priority actions.118 Table 12 shows the ESA status of the eight listed species. The Eastern North Pacific Distinct Population Segment (DPS) of Gray Whales were previously listed as endangered but were delisted in 1994 due to recovery.119

Table 12: NSB Endangered Species Status

<table>
<thead>
<tr>
<th>Species Common Name</th>
<th>ESA Status</th>
<th>Jurisdiction</th>
<th>Additional Protections</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bearded Seal (Beringia DPS)</td>
<td>Threatened</td>
<td>NOAA</td>
<td>MMPA Depleted ADF&amp;G</td>
</tr>
<tr>
<td>Bowhead Whale</td>
<td>Endangered</td>
<td>NOAA</td>
<td>MMPA Depleted IWC Protected ADF&amp;G</td>
</tr>
<tr>
<td>Eskimo Curlew</td>
<td>Endangered – may be extinct</td>
<td>USFWS</td>
<td>MBTA ADF&amp;G</td>
</tr>
<tr>
<td>Polar Bear</td>
<td>Threatened</td>
<td>USFWS</td>
<td>MMPA Protected ADF&amp;G</td>
</tr>
<tr>
<td>Ringed Seal (Arctic DPS)</td>
<td>Threatened</td>
<td>NOAA</td>
<td>MMPA Depleted ADF&amp;G</td>
</tr>
<tr>
<td>Spectacled Eider</td>
<td>Threatened</td>
<td>USFWS</td>
<td>MBTA ADF&amp;G</td>
</tr>
<tr>
<td>Steller’s Eider</td>
<td>Threatened</td>
<td>USFWS</td>
<td>MBTA ADF&amp;G</td>
</tr>
</tbody>
</table>

The ESA requires the designation of critical habitat for a listed species when it is “prudent and determinable.”120 Critical habitat areas are essential to the conservation of a species, and designation of critical habitat affects federal agency actions or federally funded or permitted actions within the designated area. Of the ESA-listed species with range in the NSB, two have

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designated critical habitat within the NSB: Steller’s eider and polar bear, shown in Map 4. Critical habitat for the Arctic Ringed Seal is currently proposed.

Three distinct types of critical habitat currently exist for polar bear: sea ice habitat, terrestrial denning habitat, and barrier island habitat. Sea ice critical habitat provides for bear feeding, breeding, denning, and movement. Barrier island critical habitat encompasses offshore islands offset from the mainland coast of Alaska. Areas within one mile of the barrier islands is known as the no-disturbance zone. According to the USFWS, a one mile distance was chosen because female polar bears were shown to react to snow machine traffic within this distance, and adult females are the most important age and sex class in the population. 121 The barrier island habitat and no-disturbance zone exclude the coastal townsites of Kaktovik and Utqiaġvik.

Both the spectacled eider and Steller’s eider are listed as threatened under the ESA. After departure from their nesting and breeding grounds in the late summer and fall, both Steller’s and spectacled eiders migrate south through the Chukchi Sea to southwest Alaska to molt and winter. Spectacled eiders gather along the Chukchi and Bering Sea coasts to molt in very large flocks of over 80,000 individuals. Critical habitat has been designated by USFWS in areas where eiders congregate during breeding, molting, wintering, and spring staging. One of the areas designated as critical habitat is Ledyard Bay, one of the primary molting grounds for female spectacled eiders breeding on the North Slope.

The Arctic DPS of ringed seal (arctic ringed seal) offer important subsistence resources and are prey for other protected species including the polar bear. In 2014, NOAA Fisheries proposed the Alaska coastline and Exclusive Economic Zone (EEZ) from the Beaufort Sea south to Cape Avinof be designated as critical habitat for the arctic ringed seal. The proposed critical habitat provides sea ice conditions that are essential for the survival of arctic ringed seals. This critical habitat has not yet been adopted and finalized into regulation. 122

Pacific walrus use Chukchi Sea waters for foraging and transiting, and are currently a candidate for listing under the ESA. Walruses are known to haulout in large numbers to rest in many locations along the Chukchi Sea coastline, including near Point Lay. Large herds of walruses at a haulout can panic and stampede if disturbed. Due to receding sea ice, walruses spend more time at terrestrial haulouts where calves and young can suffer increased mortality due to stampeding.123 During times when walruses are hauled out on ice near Point Lay, the Native Village of Point Lay, in partnership with the USFWS and other federal organizations, have requested that the media and tourists refrain from visiting the community to view the walruses. The Native Village of Point Lay has redirected subsistence hunters from haulouts, and even rerouted local airline flights to avoid causing mortality due to stampede.124

CLIMATE CHANGE AND SUSTAINABILITY

The cold and frozen Arctic environment is extremely susceptible to warming temperatures. Climate change is faster and more severe in the Arctic than in other parts of the world, and the Arctic is warming at a rate of almost twice the global average.125 Changes in sea ice coverage are one of the most drastic ways to see the impact of warming global temperatures. September is historically when sea ice is at a minimum, and satellite observations taken since 1979 show that September Arctic sea ice is now declining at a rate of 13.2 percent per decade.126 Diminishing sea ice can further exacerbate climate change as areas of open water are exposed which can absorb more heat from the sun.

Several decades ago shore-fast ice absorbed energy of the waves along the Chukchi and Beaufort Sea coastlines. Summer sea ice retreat has led to longer open water seasons, making the Alaskan Arctic coastline more vulnerable to erosion.127 During fall, the prime storm season, the coastline is exposed and warm waves reaching the NSB coastline erode cliffs of once-frozen soil into the sea.128 Roads, homes, and infrastructure along the coastline is at risk during each storm, and damages do to eroding coastline can be costly to the NSB and dangerous to residents. In 2018, the U.S. Army Corps of Engineers (USACE) published a Draft Coastal Erosion Feasibility Study for Utqiagvik, noting that frequent and severe coastal storms threaten public health and safety, the economy, over $1 billion of critical infrastructure, access to subsistence areas, and cultural and historical resources.129

The rolling tundra of the NSB, a complex of lakes, streams and wetlands, is underlain by permafrost. A warming climate contributes to the thawing of this permafrost which can have many detrimental effects. Melting permafrost under NSB communities results in land subsidence, which can create sink holes and damage infrastructure. Underground ice cellars have been damaged or have failed entirely. Ice cellars are used traditionally to store harvested subsistence foods and are passed down in families for generations. Damaged and failing ice cellars threaten both food security and safety.130 Melting permafrost also carries sediment into fresh water, where increased sediment load can make rivers and lakes wider and shallower. Riverine erosion occurs mostly in the spring when ice scouring, snow melt off, and bank slumping following thaw occurs.131 Additionally, melting permafrost releases additional carbon

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dioxide and methane into the atmosphere, resulting in additional warming.\textsuperscript{132}

Warming trends have spurred responses by plant and animal life as they accommodate earlier snowmelt, lake ice thaw, and plant growth. Many migratory species arrive to their Arctic summer grounds several days earlier in spring than recorded in the 1970s. Scientists expect these trends to continue.\textsuperscript{133}

A warming climate allows shrubs and woody vegetation to expand into the tundra, sometimes replacing lichens and other established tundra vegetation. Loss of lichens can be detrimental to caribou populations, and caribou may change migration patterns or decline in abundance due to changing vegetation. Caribou are a critical subsistence food source on the North Slope, and also provide food to predators such as bears and wolves.\textsuperscript{134}

Vegetation changes caused by climate change such as introduction of invasive or other non-native species can have ecosystem-wide impacts.

**COMMUNITY INPUT, FINDINGS, NEEDS, AND CHALLENGES**

Residents of all villages have continually expressed the natural beauty of the North Slope. It not only provides abundantly for subsistence lifestyle but also is a planning of exorbitant beauty. Outreach for the comprehensive plans have indicated that protecting the natural environmental from climate change and to protect subsistence resources – both land and sea.

Environmental and concerns identified by workshop participants are provided in Chapter 2 and listed below:

- Climate change effects on subsistence and food security
- Climate change increasing extreme weather events/conditions
- Coastal erosion


Additional issues

- Failing ice cellars
- Subsidence
- Potential damage to high value wetlands
- Accelerated permafrost melt from exposed bluffs
- Air quality, particularly near Prudhoe Bay oilfields
- Protection of endangered and threatened species and their habitats
- Diminished near shore sea ice
- Invasive species resulting from climate change
- Infrastructure at risk due to climate change and environmental factors
- Migratory changes

Findings

Air quality and water quality is generally good throughout the borough.

Quality of life, which includes environmental quality, is an increasingly important criterion in private sector economic investment decisions.

Climate change is affecting in the arctic dramatically.

Needs & Challenges

Ice cellars are failing, creating food security concerns.

Potential air pollution may not be well monitored or within the control of the local government or the North Slope Borough.

Climate change poses a significant challenge to the region – from increased marine traffic, changes in weather patterns, diminishing sea ice, and changing migration routes.

More advanced testing techniques may identify newly recognized contaminants, which may be present in village water sources. Subsidence poses a significant issue to infrastructure in several villages.
PRIMARY NATURAL ENVIRONMENT GOAL

Goal Ten: Protect our environment.

Objective 1: Seek a healthy arctic environment through leadership in land use and wildlife management.

10.1.1. Coordinate with resource agencies to identify and map watersheds, wetlands, and traditional trails in the North Slope Borough that are important for subsistence.

10.1.2. Evaluate existing zoning and land use regulations for effectiveness in protecting sensitive areas, including establishing a zoning district(s) specifically for subsistence and/or special habitats.

10.1.3. Develop a wetlands mitigation bank that compensates for expected adverse impacts to the environment.

Objective 2: Identify, remediate, and remove contamination and hazardous waste.

10.2.1. Identify existing and abandoned sites with garbage, hazardous waste, and toxic substances and seek funds for demolition and clean-up.

10.2.2. Educate village residents about proper disposal of garbage, hazardous waste, and toxic substances.

10.2.3. Enforce existing laws and policies to prevent future contamination.

10.2.4. Develop a system for the export of hazardous and other non-disposable material.
Chapter Six
Subsistence
Wild resources – animals, fish, and plants – are harvested, processed, shared, and consumed in an economy and way of life known as ‘subsistence.’ Subsistence activities are common across the entire State of Alaska. Residents of populated urban areas harvest approximately 13.4 million pounds of wild food under subsistence, personal use, and sport regulations. However, it is the rural subsistence users that are the most active, harvesting an estimated 36.9 million pounds of wild foods annually.

Collectively, the subsistence activities of hunting, fishing, and gathering constitute a way of being and relating to the world and are an essential component of Alaska Native identities and cultures. Many Native Alaskans depend on subsistence activities for both nutritional and spiritual nourishment and have been central to a tribe’s customs and traditions for centuries. For the Iñupiat of the North Slope, engaging in subsistence activities is paramount to maintaining ancestral traditions.

DEFINITION OF SUBSISTENCE

There are a number of definitions of subsistence and many different understandings of its meaning. What is clear is that the term means different things to people based on their cultural upbringing.

The North Slope Borough Municipal Code defines subsistence as:

“An activity performed in support of the basic beliefs and nutritional needs of the residents of the Borough and includes hunting, whaling, fishing, trapping, camping, food gathering, and other traditional and cultural activities (NSBMC 19.20.020).”

The Alaska legislature passed the state’s first subsistence statute in 1978, establishing subsistence as the priority use of Alaska’s fish and wildlife. The law highlights the unique role that subsistence harvesting takes in Alaska. The definition outlined in AS 16.05.940(33) is:

“...the noncommercial, customary and traditional uses of wild, renewable resources by a resident domiciled in a rural area of the state for direct personal or family consumption as food, shelter, fuel, clothing, tools, or transportation, for the making and
selling of handicraft articles out of nonedible by-products of fish and wildlife resources taken for personal or family consumption, and for the customary trade, barter, or sharing for personal or family consumption; in this paragraph, “family” means persons related by blood, marriage, or adoption, and a person living in the household on a permanent basis.”

The Alaska National Interest Lands Conservation Act, a federal law passed in 1980, does not define subsistence, but rather subsistence uses. In Section 803, subsistence uses are:

“the customary and traditional uses by rural Alaska residents of wild, renewable resources for direct personal or family consumption as food, shelter, fuel, clothing, tools or transportation; for the making and selling of handicraft articles out of nonedible by-products of fish and wildlife resources taken for personal or family consumption; and for the customary trade, barter or sharing for personal or family consumption.”

While the term subsistence implies the use of natural resources for physical needs, it may not always convey the spiritual and cultural importance of those harvest activities. For Alaska Natives of the North Slope, subsistence is a connection to the land and the way the Iñupiat passed down traditional knowledge through generations. It is not only a way of life, but also the joy of living from the gifts that the Creator provides.

Village Areas of Influence

The residents of the North Slope Borough travel throughout the region for subsistence pursuits. The use areas for the North Slope’s coastal villages extend miles out into the ocean. Inland waters, such as rivers and lakes, are also used as fishing and bird hunting areas. The combined Areas of Influence for NSB villages is depicted in Map 5. This map illustrates the range that many hunters will go during subsistence activities. Many will venture farther than these boundaries illustrate; annual conditions are never identical.

Yet, simply identifying traditional harvest areas underrepresents areas that must be considered for their importance to Iñupiaq hunters: camps, cabins, access routes, butchering sites, and staging areas. Also importance for subsistence activities is migratory species routes and patterns. Disruptions to migratory patterns of whales, caribou, fish, and waterfowl can divert animals from traditional harvest areas and subsistence users. Native allotments (discussed in Chapter 15) inherently involve subsistence-related activities.

The subsistence hunting areas for land mammals are the most extensive of all subsistence use areas. The area covers nearly the entire North Slope Borough, extending from the Brooks Range to the coastal plains and from the Canadian border to the Chukchi Sea coast. Modes of inland travel include a variety of all-terrain vehicles and snow machines. Almost the entire coastline of the borough is used for marine mammal hunting, extending at least twenty-five miles offshore. A combination of traditional skin boats and motorized boats are used for riverine and marine subsistence activities. Snow machines are also commonly used during the winter months for hunting marine mammals from the sea ice.
The Alaska Department of Fish and Games regulates hunting and fishing throughout the state to sustainably manage the state’s resources. There are four Game Management Units within the NSB area of influence for subsistence use purposes, which are shown in Map 6. Bag limits are defined by the state and published annually.138

Waterfowl are jointly managed by the state and federal governments and a caucus representing eligible Alaska Native tribes. A state hunting license and both state and federal waterfowl stamps are required to subsistence hunt waterfowl.139

Subsistence hunting for marine mammals is managed by the National Marine Fisheries Service (seals, sea lions, whales) and the U.S. Fish and Wildlife Service (sea otters, polar bears, walrus). 140

**SUBSISTENCE HARVEST**

Subsistence activities are a year-round event on the North Slope, and are oriented both to the land and to the sea. Birds, fish, marine mammals, land mammals, and plants are all sources of subsistence food and supplies. Coastal communities are logically more dependent upon marine mammals and coastal resources, while inland communities are more dependent upon caribou and other terrestrial resources. Bowhead whales, beluga whales, several species of seals, and caribou still provide the bulk of subsistence needs for local communities. Other subsistence resources include: waterfowl, ptarmigan, anadromous and freshwater fish, furbearers, large mammals, and vegetation.

Annual use patterns are dependent upon natural cycles, availability of resources, travel conditions, and other environmental factors. Some species may be present year-round, but are only harvested when permitted by a regulatory entity. Other species are opportunistically harvested or as environmental conditions (such as sea ice) allow furbearers are not often harvested during the summer months as the pelts are lighter and the animals are raising their young.

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138 Specific regulations can be found on the Alaska Department of Fish and Game Hunting Maps by Game Management Unit website at: www.adfg.alaska.gov/index.cfm?adfg=huntingmaps.bygmu&gmu=26.
140 Ibid
In addition to the waterfowl, terrestrial animals, and marine mammals, North Slope residents also pick a variety of berries, typically during the months of July through August. Due to climate change, some communities have been able to harvest berries as late as mid-October. Across the North Slope, residents enjoy the bounty of salmonberries (cloud berries), low bush cranberries, alpine blue berries, crow berries (blackberries), and bearberries.

While caribou, fish, and waterfowl are part of the subsistence diet, the bowhead whale is the foundation of the Iñupiat. The coastal villages of Point Hope, Point Lay, Wainwright, and Utqiagvik typically begin annual spring whale hunts in early May. The fall whaling communities are Kaktovik, Nuiqsut, Utqiagvik, and Wainwright. Due to the bowhead whales’ traditional fall migratory route, Utqiagvik and Wainwright are the only whaling communities that are afforded both spring and fall whaling. Spring sea ice conditions only allow for Kaktovik and Nuiqsut to participate in fall whaling. The Alaska Eskimo Whaling Commission reported there were 87 NSB registered whaling crews during the 2017 season. These whaling crews harvested a total of 46 whales for the year.

While the whale is shared with the inland communities of Atqasuk and Anaktuvuk Pass, these residents primarily depend on caribou. All of the North Slope communities hunt caribou.

The bountiful subsistence harvest is shared widely with people across the North Slope and other nearby regions. A practice that has sustained the Iñupiat since time immemorial.

**Subsistence Economy**

Subsistence users across the NSB rely upon a variety of terrestrial, marine mammals, fish, and waterfowl for some or all of their diet. According to a 2015 North Slope Borough Social and Economic Profile and Census, nearly all of NSB households’ diets included at least some subsistence foods (97.3 percent), down slightly from 2010 when 97.9 percent of residents reported having at least some subsistence foods in their diet. However, those households whose diets consisted of half or more of subsistence foods have decreased, from 65.7 percent in 2010 to 63.7 percent in 2015.  

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**Notes:**


The traditional Iñupiat values guide the Iñupiat in their everyday lives. It is through these values, the North Slope Iñupiat share the subsistence bounty with elders, families in need, families that are unable to hunt for themselves, friends and relatives. Bartering is also practiced. Residents from coastal villages may barter ágvík (bowhead whale) for inland caribou, berries, masu (Eskimo potato) or greens, if their area is scare of those resources.

Sharing also goes beyond the borders of the North Slope Borough. North Slope residents not only share within their communities, but with communities within the NANA region and Anchorage. Table 13 details where households share subsistence foods.

Table 13: 2015 Household Subsistence Sharing

<table>
<thead>
<tr>
<th>Were subsistence foods were shared...</th>
<th>Anaktuvuk Pass</th>
<th>Atqasuk</th>
<th>Kaktovik</th>
<th>Point Hope</th>
<th>Nuiqsut</th>
<th>Point Lay</th>
<th>Utqiagvik</th>
<th>Wainwright</th>
</tr>
</thead>
<tbody>
<tr>
<td>Within own community</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>100.0%</td>
<td>87.8%</td>
<td>97.9%</td>
<td>95.0%</td>
<td>97.7%</td>
<td>100.0%</td>
<td>94.3%</td>
<td>97.2%</td>
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<td>No</td>
<td>0%</td>
<td>12.2%</td>
<td>2.1%</td>
<td>5.0%</td>
<td>2.3%</td>
<td>0%</td>
<td>5.7%</td>
<td>2.8%</td>
</tr>
<tr>
<td>Other NSB Community</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Yes</td>
<td>49.3%</td>
<td>62.5%</td>
<td>50.0%</td>
<td>66.0%</td>
<td>63.2%</td>
<td>67.9%</td>
<td>54.8%</td>
<td>51.0%</td>
</tr>
<tr>
<td>No</td>
<td>50.7%</td>
<td>37.5%</td>
<td>50.0%</td>
<td>34.0%</td>
<td>36.8%</td>
<td>32.1%</td>
<td>45.2%</td>
<td>49.0%</td>
</tr>
<tr>
<td>Any NANA Community</td>
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<tr>
<td>Yes</td>
<td>5.8%</td>
<td>5.0%</td>
<td>10.4%</td>
<td>83.8%</td>
<td>20.7%</td>
<td>34.5%</td>
<td>28.2%</td>
<td>19.2%</td>
</tr>
<tr>
<td>No</td>
<td>94.2%</td>
<td>95.0%</td>
<td>89.6%</td>
<td>16.2%</td>
<td>79.3%</td>
<td>65.5%</td>
<td>71.8%</td>
<td>80.8%</td>
</tr>
<tr>
<td>Anchorage</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>29.3%</td>
<td>41.7%</td>
<td>80.2%</td>
<td>47.7%</td>
<td>36.4%</td>
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<td>36.5%</td>
</tr>
<tr>
<td>No</td>
<td>78.3%</td>
<td>70.7%</td>
<td>58.3%</td>
<td>19.8%</td>
<td>52.3%</td>
<td>63.6%</td>
<td>51.6%</td>
<td>63.5%</td>
</tr>
</tbody>
</table>

Iñupiaq values are ever present in today’s North Slope communities, as indicated in the 2015 NSB Economic Profile & Census Report. Ninety-one percent of Iñupiat household head respondents felt that sharing and support from other community members has remained the same or has increased in the previous 12 months. One quarter to one third of respondents felt support increased. This level of sharing indicates that Iñupiaq values are ever present in today’s North Slope communities.

Subsistence activities are not oriented toward sale or profits but rather, are focused on meeting the nutritional and clothing needs of families and communities. Some parts of the harvest are used for a variety clothing, skin boats, hunting implements, and traditional arts and crafts. Coastal communities rely upon marine mammals to make skin boats, in addition to caribou tendons to sew skin boats. Ivory from walrus is used to make a variety of intricate crafts, such as earrings, necklaces, and cribbage boards. Inland Nunamiut craft traditional caribou skin masks. These are just a few examples of the subsistence hunt providing more than the harvest nutritional value.

The fishing, whaling, and hunting areas of the NSB cover over a 94,000 square mile area. Hunters must cover considerable ground to harvest marine mammals and terrestrial animals. As such, use of snow machines, boats, and ATVs are efficient tools and, therefore, money for these vehicles, their maintenance and repair, and fuel, along with rifles and ammunition, is a requirement for subsistence living. Often, a hunter must work in wage employment during the weekday and hunt and fish in the summer evenings or on the weekends, emphasizing the need for a speedy land or water craft to make efficient use of this limited time for hunting and harvesting.

Subsistence activities require substantial finances to purchase costly transport (snow machines, ATVs, boats, sleds, parts, and fuel), tools (ammunition, firearms, nets, floats, and harpoons), and food preparation and storage materials (knives, smokers, freezers, pots, and pans). Dividend income and local employment provide the means to purchase tools, equipment, and supplies that make traditional subsistence harvest activities more time-efficient. Families use employment income to purchase 4 to 6-wheeled Argo all-terrain vehicles, snow machines, boats, fuel, rifles, ammunition, nets, sheds, fish wheels, traps, knives, rope, baskets, tubs, freezers, and other tools of the trade.

**Subsistence Vulnerabilities**

Subsistence resources and users within the borough’s area of influence are vulnerable to human activities, such as oil and gas exploration and development and an increased number of hunters, as well as long term changes, such as climate change affecting sea ice conditions as well as land vegetation (the effects of climate change are presented in Chapter 5). Disturbance to subsistence resources can alter migration patterns and cause hunters to travel greater distances which increases their expenses and exposure to hazards. Some of the activities with

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The potential to affect subsistence activities are summarized below.

The availability of subsistence resources in the borough’s area of influence and residents’ access to those resources may change due to the impacts of sport hunting, commercial recreation, scientific studies, and road construction as well as to the effects of climate change, such as permafrost melt and increases in severe storm events and tundra fires. Sport hunters that take the vanguard of the caribou herds, low flying aircraft harassing wildlife, and the draining of lakes for ice roads can alter wildlife ecosystems and migratory patterns, causing hunters to travel greater distances or potentially miss hunting opportunities entirely. Late freeze-up can limit snow machine access to the tundra for caribou hunts; and accelerated thawing of the permafrost can release methane gases that can alter food sources for mammals, fish and fowl, which may result food scarcity. In the future, warmer summers may breed a greater number of mosquitoes or other pests which harass caribou populations, altering the timing and route of their travels. Melting permafrost may lower the surface level of fresh water lakes. Drier summers may also reduce lake water levels and alter fish habitat. Additionally, loss of wage income related to decreased oil development and revenues on the North Slope, over time, may reduce the ability for residents to afford modern hunting equipment.

The Iñupiat have had, and continue to have, a tremendous capacity to persevere and adapt to change. Throughout outside influences on the North Slope, from wage labor and resource scarcity during the eras of commercial whaling, fur trading, reindeer herding, military installations, and oil and gas development, the Iñupiat have retained their hunting, fishing, gathering and sharing skills, and social networks. In the face of new circumstances and vulnerabilities, existing and future village Elders will continue to share with the youth their knowledge of traditional tools and equipment, the variability of ecosystems and weather, wildlife harvesting skills, and environmental stewardship to facilitate the region’s adaptation to climate and economic change for generations to come.

Many NSB residents have expressed frustration with non-resident hunters disrupting the traditional migratory routes of the caribou. Areas critical to the welfare of the subsistence species, such as concentration areas, calving
areas, feeding areas, and molting and brooding areas are particularly vulnerable to disturbance.

Alaska resident and non-resident sport hunters, many of them bow hunters, access caribou hunting areas from the Dalton Highway. In 2010, about 1,500 sport hunters harvested approximately 900 Central Arctic Herd caribou. In 2016, U.S. Fish and Wildlife Services reported the Central Arctic Herd declined from 70,000 in 2010 to 22,000.145

Sport hunters are considered non-Iñupiat or non-resident hunters who arrive alone or in groups, with or without a commercial guide. Commercial outfitters or guides require a North Slope Borough Commercial Recreation land use permit issued by the NSB Planning and Community Services Department. Non-guided hunters do not need a NSB Commercial Recreation land use permit, however they do need a hunting license as well as permission to hunt on land they do not own, as do Commercial Recreation guides. During the comprehensive planning outreach, residents have expressed concern that the NSB does not notify residents of permits issued for game hunting until after permits are issued. Low-flying aircraft from sport hunters can harass wildlife, particularly caribou. Often, commercial outfitters will target the vanguard of a herd, causing the rest of the animals to scatter. Changing migration patterns cause residents to travel greater distances, at greater expense and risk, to find and harvest their caribou. Animals are harder to find and when travelling greater distances. Hunters risk the meat spoiling before they can reach the village. In addition, sport hunters sometimes leave carcasses and meat on the tundra and take only the antlers. This practice is offensive to the subsistence users who rely on the caribou harvest.

Another vulnerability to subsistence hunting is increased marine traffic in the Arctic. This may threaten the marine mammal resources that the Iñupiat rely upon for their subsistence nutritional needs. The increased traffic could alter traditional migration of the bowhead whale, the foundation of the Iñupiat culture and mainstay of subsistence resources. Increased marine traffic could also affect the harvesting of walruses and seals.

Warming arctic conditions have caused changes in sea ice that is affecting marine subsistence hunting. It has also caused traditional underground ice cellars to fail. Ice cellars are cut directly into the permafrost to store food. When the permafrost melts, the subsistence foods, such as whale, caribou, and seal stored in ice cellars can rot. This compounds two other problems with these traditional food sources: the animals have grown more scarce, and collecting them has become more difficult and dangerous because of melting sea ice and flooded lands. This has led to food security issues.146 Without a place to reliably store traditional foods, in some cases subsistence hunters must rely on store-bought freezers or the expensive food sold on grocery store shelves.

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SUBSISTENCE MANAGEMENT

The NSB Department of Wildlife Management facilitates sustainable harvests and monitors populations of fish and wildlife species through research, leadership, and advocacy from local to international levels. While the Wildlife Management Department lacks regulatory authority to directly manage subsistence resources, its scientific research and cumulative observational efforts have influenced key state, federal, and international decisions on the management of subsistence resources to favor North Slope residents. The Department’s efforts have been a key element in being able to verify the traditional knowledge of the Iñupiat, providing a sound basis for resource management. The Department diversifies funding opportunities through submission of grant proposals focusing on subsistence species and issues of the highest interest to North Slope residents.

The department is responsible for helping to assure participation by NSB residents in the management of wildlife resources, by keeping these resources at healthy population levels, and to assure that residents can continue their subsistence harvest of wildlife resources. Their studies help provide the factual documentation of the subsistence needs of borough residents. With industrial activity expanding into new areas, arctic warming trends already affecting the marine and land environments, and some special interest groups trying to further regulate subsistence hunting, it is very important their work continue.147


International Whaling Commission

IWC was established under the 1946 International Convention for the Regulation of Whaling. The commission’s purpose is to provide for the proper conservation of whale stocks and make possible the orderly development of the whaling industry. An integral part of the Convention is its legally binding schedule that sets specific measures that the IWC has collectively decided are necessary in order to regulate whaling and conserve whale stocks. These measures include catch limits (which may be zero as in the case for commercial whaling) by species and area; designating specified areas as whale sanctuaries; protection of calves and females accompanied by calves; and restrictions on hunting methods.148

Representatives of the North Slope Borough regularly attend the biennial meetings.

U.S. Marine Mammal Commission

The Marine Mammal Commission is an independent government agency charged by the Marine Mammal Protection Act to further the conservation of marine mammals and their environment. The commission works to ensure that marine mammal populations are restored and maintained as functioning elements of healthy marine ecosystems in the world’s oceans. The commission is comprised of three

members that are nominated by the president of the United States and confirmed by the senate. The commission is assisted by a nine-member Committee of Scientific Advisors. There is currently one member on the Committee of Scientific Advisors that lives on the North Slope.149

Alaska Board of Game
The Board of Game consists of seven members serving three-year terms. Members are appointed by the governor and confirmed by the legislature. The Board of Game's main role is to conserve and develop Alaska's wildlife resources, including establishing open and closed seasons, areas for taking game, setting bag limits, and regulating methods and means as well as setting policy and direction for the management of the state's wildlife resources. The board is charged with making allocative decisions, and the Department of Fish and Game is responsible for management based on those decisions.150 Currently, there are no North Slope residents on the Board of Game.

Alaska Eskimo Whaling Commission
AEWC is a critical regional entity, with influence on local, regional, national, and international policies that affect bowhead whales. The Commission functions as a non-profit corporation, with the goal of protecting bowhead whales, their habitat, and Native subsistence uses of bowhead whales.

AEWC is comprised of eleven members, each representing one whaling village. Six of the villages are located on the North Slope: Point Hope, Point Lay, Wainwright, Utqiagvik, Nuiqsut, and Kaktovik. Other member villages include: Savoonga, Kivalina, Wales, Little Diomede, and Gambell. Each community has a whaling captains’ association that coordinates whaling activities in the village and informally with AEWC.151

The AEWC is a strong supporter of bowhead whale research. The commission was initially formed in 1977 to represent ten Eskimo whaling communities before the United States government and the IWC placed a ban on subsistence harvest of the bowhead whale. Since 1981, AEWC has managed the bowhead whale subsistence hunt locally through a cooperative agreement with the National Oceanic and Atmospheric Administration (NOAA) at the U.S. Department of Commerce. AEWC works closely with NOAA throughout the year and reports subsistence harvest results. AEWC also works with the oil industry to develop the Good Neighbor Policy and Conflict Avoidance Agreements for oil and gas exploration and development activities in waters offshore the North Slope Borough.

Alaska Beluga Whale Committee
The Alaska Beluga Whale Committee (ABWC) was formed in 1988 and is comprised of hunters, managers, and scientists. Its goals include maintaining a healthy beluga whale resource for subsistence use and public enjoyment for future generations; encouraging safe and efficient harvesting of beluga whales; ensuring accurate harvest information and biological samples from each region; educating and promoting understanding about issues surrounding belugas and subsistence harvesting; and overseeing the

enforcement of regional management plans, hunting guidelines, and habitat protection laws.\textsuperscript{152}

The membership of the ABWC is made up of representatives from approximately 30 communities that harvest belugas in the North Slope, Chukchi Sea, Kotzebue Sound, Norton Sound, Yukon Delta, Kuskokwim, and Bristol Bay. The North Slope Borough, the Alaska Department of Fish and Game and NOAA National Marine Fisheries Service (NOAA-NMFS) are also members.\textsuperscript{153}

**Eskimo Walrus Commission**

The Eskimo Walrus Commission (EWC) was formed in 1978 and represents 19 Alaskan coastal walrus hunting communities, including Utqiaġvik, Point Lay, and Point Hope. Initially formed as a consortium of Native hunters, the EWC is now a recognized statewide entity working on resource co-management of walrus. In 1997, a cooperative agreement between the U.S. Fish and Wildlife Service and the EWC was developed to ensure the participation of subsistence hunters in conserving and managing walrus stocks.

The EWC provides information to member communities on the current research, politics, regulations, and issues affecting the Pacific walrus population and subsistence communities.\textsuperscript{154}

**Ice Seal Committee**

The Ice Seal Committee (ISC) was formed in December of 2004 and consisted of five delegates, one from each of the five regions where ice seals occur in Alaska. The committee seeks to both preserve and enhance the marine resources of ice seals, including its habitat as well as the Alaska Native culture, traditions, and activities associated with subsistence uses of ice seals. To accomplish this, the ISC is involved with education and research related to ice seals.\textsuperscript{155}

**Western Arctic Caribou Herd Working Group**

The Western Arctic Caribou Herd Working Group (WG) includes subsistence users, other Alaskan hunters, reindeer herders, hunting guides, transporters, and conservationists. There are three members from the North Slope, representing Anaktuvuk Pass and Nuiqsut; Point Lay and Point Hope; and Atqasuk, Utqiaġvik, and Wainwright. The Alaska Department of Game and Fish, U.S. Bureau of Land Management, U.S. National Park Service, and U.S. Fish and Wildlife support and advise the working group when needed or requested by the group. The group


\textsuperscript{153} Ibid


identifies concerns, requests information, and advocates for actions that will conserve and benefit the herd.\textsuperscript{156}

United Caribou Association of the Nunamiut
The United Caribou Association of the Nunamiut (UCAN) was established in 2014 for the Anaktuvuk Pass community to protect the village’s primary source of subsistence foods as a united front. The community hopes that the Association will serve a similar function for Anaktuvuk Pass and other communities that depend on caribou for subsistence in the same way that the Alaska Eskimo Whaling Commission represents coastal arctic communities that rely on the bowhead whale. UCAN is controlled by the tri-lateral committee, made up of representatives from the City of Anaktuvuk Pass, the Naqsragmiut Tribal Council, and the Nunamiut Corporation. They hope to protect subsistence activities and resources through local coordination and with the federal and state governments.

COMMUNITY INPUT, FINDINGS, NEEDS, AND CHALLENGES
Subsistence and cultural activities play a large role in the lives of North Slope residents. Most residents depend on subsistence activities for both nutritional and spiritual nourishment. These activities and traditions are also essential to maintaining ancestral traditions. While technological advances, climate change, and oil and gas exploration on the North Slope bring benefits to residents, they also affect residents’ ability to engage in subsistence activities and other cultural pursuits.

Subsistence and cultural issues and concerns identified by workshop participants are provided in Chapter 2 and listed below:

- Climate change effects on subsistence and food security
- Iñupiaq language is endangered
- Loss of language and knowledge
- Road connection would have negative impacts on lifestyle, culture, hunting, control, additional load on infrastructure, housing
- Contradiction between technology and culture
- Food insecurity
- Climate change and food security: melting ice cellars, ice pattern changes, changing culture

\textsuperscript{156} Western Arctic Caribou Herd Working Group. About. https://westernarcticcaribou.net/.
Findings

Rural Alaska subsistence users harvest an estimated 36.9 million pounds of wild foods annually.

Many Native Alaskans depend on subsistence activities for both nutritional and spiritual nourishment.

North Slope residents often travel great distances during subsistence harvest activities, covering over a 94,000 square mile area.

Village Areas of Influence overlap; residents utilize common areas for subsistence activities.

Nearly all of NSB households’ diets included at least some subsistence foods.

Subsistence activities require substantial finances to purchase costly transport, tools, and food preparation and storage materials.

Subsistence resources and users are vulnerable to human activities, such as oil and gas exploration and development and climate change.

The NSB Department of Wildlife Management contributes scientific research that have influenced key state, federal, and international decisions on the management of subsistence resources to favor North Slope residents.

There are a number of boards and committees focusing on protecting wildlife populations and subsistence activities.

Needs & Challenges

Disruptions to migratory patterns of whales, caribou, fish, and waterfowl can divert animals from traditional harvest areas and subsistence users.

Disturbance to subsistence resources can alter migration patterns and cause hunters to travel greater distances which increases their expenses and exposure to hazards.

Non-resident hunters can disrupt the traditional migratory routes of caribou.

Increased marine traffic may threaten the marine mammal resources.

NSB does not notify residents of permits issued for game hunting until after permits are issued.
**PRIMARY SUBSISTENCE GOALS**

Goal One: Cooperate with land owners and land managers to update land use regulations consistent with village priorities.

Objective 1. Land use regulations and procedures should reflect current goals and priorities.

1.1.1. Revise the borough’s zoning and subdivision ordinances for consistency with the goals of this plan and borough priorities.

1.1.2. Ensure revised zoning and land use regulations provide positive impacts and do not allow incompatible uses.

1.1.3. Encourage infill development with parcels already served by roads and water and sewer connections, potentially through incentives.

1.1.4. Incorporate traditional knowledge into local regulations as appropriate.

1.1.5. Protect subsistence corridors and hunting and fishing areas through the development of a subsistence zoning district.

1.1.6. Ensure inclusion of villages in the notification and decision-making process before permits are issued.

1.1.7. Establish future transportation and utility corridors where appropriate with collaboration with federal and state agencies and landowners.

1.1.8. Develop design and building standards that reflect the arctic climate and culture.

1.1.9. Ensure rezoning, subdivisions, and permitting processes are streamlined, predictable, and understandable.

Objective 2: Promote cooperation between Native, federal, and state, local and private entities.

1.2.1. Recognize and respect that North Slope communities have different land use planning and development needs.

1.2.2. Create a strategy with the respective state and local decision-makers to complete the land selection process for the borough, Native corporations, and municipalities to more effectively and cooperatively plan for land management and current and future needs.
1.2.3. Develop cooperative agreements between landowners, cities, NSB, and state and federal regulatory agencies to coordinate land development funding and logistics.

1.2.4. Coordinate closely with state and federal regulators to ensure that village residents’ concerns are considered and addressed in oil and gas development proposals.

1.2.5. Increase partnerships between the NSB, Tribal and city governments, and Native corporations.

1.2.6. Remain actively engaged in state and federal land use planning and development within the borough through participation on committees, maintaining a strong relationship with agencies representatives, and consistently providing comments on potential actions.

Objective 3: Ensure comprehensive plans remain relevant.

1.3.1. Include a staggered review of comprehensive plans as part of the NSB Planning Commission’s annual calendar as needed and required by ordinance.

1.3.2. Adequately fund and prioritize comprehensive plan reviews and updates.

1.3.3. Review and update the NSB Comprehensive Plan and village comprehensive plans vision statements, background research, and goals every five years.

1.3.4. Update the comprehensive plans thoroughly at least every ten years.

1.3.5. Establish a committee, potentially comprised of Planning Commissioners, residents, NSB Mayor’s office and NSB Planning & Community Services Department staff, and others to steward the comprehensive plans and monitor and facilitate implementation progress.

1.3.6. Conduct regular reviews of implementation efforts by the NSB Planning & Community Services Department.

1.3.7. Incorporate the comprehensive plans into the annual capital improvement planning process.
Goal Five: Protect the Iñupiaq language and subsistence culture.

Objective 1: Focus efforts to more fully integrate Iñupiaq language and culture into the education and land use planning process.

5.1.1. Improve Native language fluency through partial or full immersion programs from pre-kindergarten through high school.

5.1.2. Seek funding and opportunities to assist fluent Iñupiaq speakers to become certified teachers.

5.1.3. Encourage the North Slope Borough School District and educators to further incorporate traditional and cultural values throughout the school curricula.

5.1.4. Integrate Elders into school activities through shared lunches, invitations to speak with classes, and involvement in student projects.

5.1.5. Teach traditional values to new generations by highlighting local success stories and how traditional and cultural values assisted in their success.

5.1.6. Educate state, federal and local government entities, and the oil and gas industry about the importance of traditional and contemporary local knowledge to borough residents.

5.1.7. Require that master plans, rezonings, and applicable permits incorporate aspects of traditional and contemporary local knowledge into a project’s planning and design.

5.1.8. Review environmental assessments (EA) and environment impact analyses (EIS) to ensure they include information on the importance of subsistence, traditional and contemporary local knowledge, and the Iñupiaq culture on the North Slope and provide comments to the lead federal agency to request additional information be included, if applicable.

5.1.9. Remain cognizant that road connections will bring societal changes and prepare for those changes in advance to the extent possible.
Objective 2: Protect and enhance access for traditional subsistence activities to ensure food security and cultural values.

5.2.1. Recognize the importance of traditional camps and cabins, and associated subsistence activities when managing public lands and planning for leasing, exploration, and development of petroleum and mineral resources.

5.2.2. Work with the Alaska Department of Fish and Game and state and federal land managers to reduce effects on subsistence activities from outside sport and commercial hunting and fishing activities.

5.2.3. Develop low-flying aircraft regulations where applicable and coordinate with state and federal agencies to minimize flight disturbances to subsistence activities.

5.2.4. Manage growth along the Dalton Highway Corridor that ensures adequate public safety, wildlife management, and subsistence resource protection.

5.2.5. Encourage more research and coordination on studying and mitigating any potential effects of future road corridors on caribou migration.

5.2.6. Encourage oil companies to allow subsistence users access to oil field roads and to limit public access.

5.2.7. Encourage industry and the State of Alaska to work with local residents when designing new roads to determine if it would be desirable to include pullouts to accommodate subsistence users.

5.2.8. Educate non-borough residents that travel to the North Slope about subsistence resources and how to minimize their impact to these resources.

5.2.9. Develop formal agreements between landowners and land managers to provide subsistence access across private, state, and federal lands.

5.2.10. Plan, design, construct, and maintain infrastructure and facilities in a manner that preserves the local environment and subsistence lifestyle.

5.2.11. Develop ice cellar guidelines to assist residents in improving the storage environment in existing cellars and creating new cellars in the most beneficial locations and design.
Goal Ten: Protect our environment.

Objective 1: Seek a healthy arctic environment through leadership in land use and wildlife management.

10.1.1. Coordinate with resource agencies to identify and map watersheds, wetlands, and traditional trails in the North Slope Borough that are important for subsistence.

10.1.2. Evaluate existing zoning and land use regulations for effectiveness in protecting sensitive areas, including establishing a zoning district(s) specifically for subsistence and/or special habitats.

10.1.3. Develop a wetlands mitigation bank that compensates for expected adverse impacts to the environment.
Chapter Seven
Public Facilities
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CHAPTER 7: PUBLIC FACILITIES

The North Slope Borough constructs and maintains much of the infrastructure within its boundaries, including water and wastewater systems, solid waste management, power generation and distribution, roads, airports, snow fences, heavy and light duty equipment, gravel resources, and communications.

The term “public facility” is inclusive of all capital assets the borough requires to provide essential services to its residents and businesses.

Table 14: NSB Capital Program Asset Value and Section

<table>
<thead>
<tr>
<th>Year</th>
<th>Asset Value</th>
<th>Section Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>06</td>
<td>$779,107,133</td>
<td>Education Facilities</td>
</tr>
<tr>
<td>07</td>
<td>$393,779,060</td>
<td>Roads, Streets &amp; Watercourses</td>
</tr>
<tr>
<td>08</td>
<td>–</td>
<td>Public Housing</td>
</tr>
<tr>
<td>09</td>
<td>$1,291,910,366</td>
<td>Water Facilities</td>
</tr>
<tr>
<td>10</td>
<td>$450,787,250</td>
<td>Sewer Facilities</td>
</tr>
<tr>
<td>11</td>
<td>$92,125,390</td>
<td>Airports</td>
</tr>
<tr>
<td>13</td>
<td>$507,863,265</td>
<td>Power &amp; Light Facilities</td>
</tr>
<tr>
<td>14</td>
<td>$122,415,100</td>
<td>Public Safety Facilities</td>
</tr>
<tr>
<td>15</td>
<td>$28,148,240</td>
<td>Sanitary Facilities</td>
</tr>
<tr>
<td>17</td>
<td>$3,720,080</td>
<td>Communications</td>
</tr>
<tr>
<td>18</td>
<td>$228,697,300</td>
<td>General Capital Facilities</td>
</tr>
<tr>
<td>19</td>
<td>$134,201,000</td>
<td>Health Facilities</td>
</tr>
<tr>
<td>20</td>
<td>$36,211,100</td>
<td>Library &amp; Cultural Facilities</td>
</tr>
<tr>
<td>22</td>
<td>$114,175,600</td>
<td>Administration Facilities</td>
</tr>
<tr>
<td>Total</td>
<td>$4,183,140,884</td>
<td></td>
</tr>
</tbody>
</table>
Capital needs are forecast through the use of a Repair and Replacement Schedule. The Repair and Replacement Schedule evaluates the estimated useful life of all capital infrastructure, facilities, and equipment compared against installation dates. The Repair and Replacement Schedule indicates that more than $200 million in capital assets are being operated beyond their estimated useful life. The 2018 evaluation also suggested that capital spending needs would average $87 million per year for the next six years. In the 2018 6-Year Capital Plan, estimated needs were tempered with these observations:

“The useful life of building components, infrastructure, and equipment assets are estimated. Some assets require replacement before the end of their estimated useful life, however the replacement of many assets can be deferred when upon inspection the borough chooses to operate them beyond their estimated useful life. These decisions are made on a case-by-case basis and upgrades are only deferred when they are due. Assets being operated beyond their estimated useful life in 2018 are valued at $200 million. It is reasonable then to assume that the borough will always operate some assets beyond their useful life, therefore a capital upgrade plan is proposed that allows some deferment. The proposed annual budget allows the replacement of all assets estimated to reach the end of their useful life within the next six years to be replaced within 10 years.”\textsuperscript{157}

These observations have not diminished the need for planning, but is instead tempering an asset management philosophy to accept some conditions it cannot change. Based on this, a Proposed Minimum Annual Capital Upgrade Budget of $52.6 million was recommended in the 2018 6-Year Capital Plan. Time will tell if this recommendation is sustainable.

Capital needs are solicited in February each year from every municipal service operating entity, city, and Tribal organization. Requests for upgrades and new construction often exceed $300 million. Through a review process led by the NSB Planning & Community Services Department, non-discretionary obligations and discretionary needs are evaluated by a committee selected by the NSB Mayor to recommend an affordable Capital Ordinance for approval action by the Planning Commission and the Assembly. Upon approval by the Assembly, General Obligation Bonds are sold to finance the Capital Program with the approval of the voters. In 2018, a $75 million capital program was recommended and approved for funding; requests for funding totaled more than $400 million. Current capital spending levels are lower than the borough’s estimated needs.

The borough is beginning to finance some capital projects with general funds. Currently, general fund expenditures on capital needs are less than 10 percent of the capital program each year due to changes in the tax cap formula.

The 2018 6-Year Capital Plan introduced forecasting for funding sources other than General Obligation bond proceeds. The plan estimated that “other funding sources” would supplement General Obligation bond sales by more than 20 percent within five years.

The 6-Year Capital Plan also included some observations and recommendations for the NSB Administration to consider:

\textsuperscript{157} North Slope Borough. 2018. 6 Year Capital Plan 2018 – 2023.
• Reductions in facilities and equipment should be considered to accommodate programmatic expansion in other areas.

• Expansion of facilities and programs requiring new capital infrastructure should be avoided if possible.

• The current capital budgets for equipment are not adequate.

• The borough maintains over 1,000 pieces of light and heavy duty equipment.

During consideration of new equipment purchases, the disposal method and cost of replaced equipment should also be considered.

• A long-term strategy to reduce the total square footage of borough offices and programs may be a consolidated NSB administrative facility.

• Repair/replace existing infrastructure and facilities through 2030 does not appear affordable.

• Replacement projects and Project Analysis Reports (PAR) for replacement projects should include recommendations and budgets for the repurposing, disposing, or demolition of existing assets.

• To optimize the useful lives of building systems, design standards should be developed.

• Bond sales for the next six years should include approximately $52.6 million each year to repair/replace the borough’s existing infrastructure.

• Any program expansion will further strain the reliance of current asset upgrades or replacements on the capital program.

The NSB Department of Public Works is dedicated to the daily operations of essential municipal services and maintenance of the borough’s infrastructure, facilities, and equipment. The operation and maintenance of the NSB’s public facilities are largely funded by taxable infrastructure throughout the NSB, such as pipelines, roads, gravel pads, natural resource development equipment, and related infrastructure.

A borough typically operates outside incorporated cities to provide public facilities and services. Without exception, incorporated cities within the North Slope Borough have relinquished those powers to the borough. Community-specific information on public facilities is detailed in each community’s respective village comprehensive plan. The information contained in this chapter details the services provided by the NSB to the residents of the North Slope as well as the regional holistic approach that the NSB applies towards the provision of these vital services.

In addition to the utility services provided to residents, the borough also provides utility services in the Deadhorse and Prudhoe Bay region. A discussion of these services are contained in Chapter 8 on Service Area 10 (SA-10). Services provided in SA-10 are not subsidized by the NSB.
WATER AND WASTEWATER SYSTEMS

Water and wastewater systems throughout the NSB consist of many interdependent operations including the provision of reliable and safe water sources, treatment, storage, and delivery as well as wastewater collection, treatment, and disposal. The North Slope Borough owns, operates, and maintains water and wastewater treatment facilities in the communities of Anaktuvuk Pass, Atqasuk, Kaktovik, Nuiqsut, Point Hope, Point Lay, and Wainwright. In Utqiagvik, the water and wastewater treatment systems are owned by the NSB and operated by the Barrow Utilities and Electric Cooperative, Inc. (BUECI).

Service Subsidies

Due to the enormity of capital investments and the cost of operations, North Slope residents pay a very small share of the costs of receiving safe water and the treatment of wastewater.

Capital investments for water and wastewater infrastructure exceed $600,000 per household. If these expenses were amortized over 40 years and billed to the customers as a typical utility company or cooperative does, residents would pay $1,400 per month. General fund expenses to operate water and wastewater infrastructure exceed $800 per household per month. Yet household utility service rates are $69 per month. In Utqiagvik, the largest community, customers are also charged $.02 per gallon for usage over 3,000 gallons per month.

The financial benefit to residents is equally significant in other heavily subsidized utilities such as electricity, home heating fuel, natural gas, and automotive gasoline. If at some point residents are willing or capable of paying more for these services, then more general fund dollars would be available for job creation and other programs.

The design, construction, and operation of water and wastewater utility systems in the arctic is not without challenges. Quality of service is another challenge that will ultimately determine the success or failure of providing this service, measured in two ways:

1. Percentage of households who experience service interruptions each year (October through September period) compared to the number who do not experience service interruptions.

2. For each household that experiences a service interruption, what percentage experienced service interruptions of five days or more that year?

The goal for any utility is zero service interruptions, however two out of ten households (20 percent) experiencing service interruptions is deemed acceptable when determining overall system integrity. Any more should consider if imminent failure is possible and if more investment or system replacement is needed. The number of service interruption days is also important to consider if an individual service requires more investment or if replacement is needed. Table 15 provides detailed information on service interruptions by village.
Table 15: 2017-2018 Service Interruptions

<table>
<thead>
<tr>
<th>Community</th>
<th>Annual Service Interruption Rate*</th>
<th>Interruption days more than 5**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>10%</td>
<td>36%</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>5%</td>
<td>25%</td>
</tr>
<tr>
<td>Kaktovik</td>
<td>18%</td>
<td>14%</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>17%</td>
<td>32%</td>
</tr>
<tr>
<td>Point Hope</td>
<td>35% / 10%¹</td>
<td>22%</td>
</tr>
<tr>
<td>Point Lay</td>
<td>26%</td>
<td>67%</td>
</tr>
<tr>
<td>Utqiagvik</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Wainwright</td>
<td>51% / 27%²</td>
<td>25%</td>
</tr>
</tbody>
</table>

*An annual service interruption rate of 20% means that 2 out of 10 homes experienced service interruptions. It also means that 80% of the community did not experience any service interruptions.

**An interruption days rating of 30% means that out of all the service interruptions, 30% experienced a service interruption of 5 days or more.

¹ These communities experienced major events which affected a large number of services for a short time. The major events skew the data, so the Service Interruption Rate is shown with and without those events. More detail on the events is provided in the following paragraphs.

² Many homes in Point Lay are going to tanked service. With those homes removed, the service interruption rate has dropped from previous years.

Point Hope’s major event during 2017 – 2018 was a vacuum system failure in March 2018. Services were restored in one day. Since upgraded vacuum pumps have been installed, the vacuum system has been very reliable and the service interruption rate has dropped.

The service interruptions for 2017 – 2018 confirm that the water and wastewater system in Point Lay is not performing satisfactorily, even though there have been some improvement over the previous three years. Engineering studies have concluded that permafrost degradation has irreparably harmed the gravity sewer system; it is being abandoned in-place as waste holding tanks are installed and the community converts to a truck haul wastewater system. Wainwright service interruption rates have improved from 22 percent to 10.5 percent in 2017 - 2018 due to investments in mainline and lateral heat traces and service barrel upgrades. Increases to maintenance budgets are also reducing service interruption rates.

Wainwright’s major event was a clogged sewer main caused by a large section of in-line heat trace which had come loose and blocked the main. Service was restored temporarily several times and the blockage was cleared within a week.

Planned repairs and maintenance activities which affect many services are not included in these rates. An example is a scheduled water main isolation to repair a leak. Residents are notified ahead of the short-term interruption. If such service interruptions were included in the rates, they would show that the infrastructure is in worse condition than it actually is.

Examining the rates on a quarterly basis shows that most interruptions happen during cold weather. Preventative maintenance efforts are
underway to make service better-insulated, heated, and air-tight. These efforts will reduce the overall number of service interruptions in the future.

**Water Sources, Storage, and Operations**

With the exception of Anaktuvuk Pass, which utilizes a well for its water supply, North Slope communities obtain water from nearby freshwater lakes. Anaktuvuk Pass and Utqiagvik are able to treat water year-round while the remaining communities treat water seasonally because the freshwater sources are frozen during winter months.

Water treatment methods in the communities vary. Typically, a nanofiltration treatment process is utilized, with the raw water first pumped through a microfilter into an intermediate tank inside the facility, and then processed in stages through a nanofilter which removes molecular-sized contaminants. In some cases, water is further chemically treated prior to storage. Exceptions to this method are Anaktuvuk Pass, which treats well water with chlorine only, and Point Lay, which, in addition to a nanofiltration process, has a reverse osmosis treatment unit that can be relocated to other communities if needed. Point Lay processes Kokolik River water which can be tidally influenced and brackish late in the pumping season.

Anaktuvuk Pass and Utqiagvik are able to produce potable water year round. The storage tanks must be sized to meet peak demand periods, firefighting needs, and occasional treatment plant downtime. All other communities must have treatment and storage capacity to make and store an adequate supply of potable water for community use to last through the winter and into the next treatment season. In addition to regular household and business use, there must be a sufficient supply of water for firefighting and to compensate for losses due to leaks and line breaks.

An alternative, year round water source would offer Point Hope, Point Lay, Atqasuk, Wainwright, Nuiqsut, and Kaktovik a stable and dependable water supply. Currently, the only alternative water sources that offer the potential for a year round water supply are deep water bodies that do not freeze during the winter or waterbodies with a high saline content. Even if wells could not be developed that meet peak system demands, a combination of well(s) and storage would provide a more stable and reliable system.158

While exploring the feasibility of alternative water sources, communities will continue to require major maintenance and upgrades to existing systems. These upgrades consist of: addressing short-term fresh water supply and storage issues; expanding distribution pipelines for homes not currently connected to the system; and converting homes back to truck haul service in locations where pipeline maintenance is no longer feasible. Additionally, updating water tank interior coatings and repairing pipeline leaks are critical to improving the overall system.

Operation, maintenance, and repair of the village systems are conducted by NSB employees or NSB representatives whose expertise is often utilized in multiple villages. However, the village

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operating systems are not standardized, making repairs and personnel training more costly. Standardization of system equipment and controls would allow operators to be trained on one system to be utilized throughout the region. Standardization would also allow for parts and service inventories to be acquired in bulk, thereby reducing purchasing costs and repair times. With repair and maintenance training streamlined, service personnel could work on multiple systems without additional site specific training. This could increase local hire employment opportunities as well as save on the costs of importing trained service personnel from elsewhere in Alaska or U.S.

Standardized systems would also be better suited to centralized systems control. Centralized control could reduce costs and may also increase attention to system problems. The feasibility of a remote operation system or remote monitoring system coupled with onsite operation should be researched and vetted.

**Water Delivery**

In all NSB communities, a combination of underground (UG) piping and truck haul/storage tank systems are used to deliver potable water to end users. In Utqiaġvik, some water piping is also maintained in heated utilidors. These piped water systems typically consist of a closed loop pressure circulation distribution system with branches to service barrels at individual buildings. These distribution systems typically have fire hydrants interspersed through the service area. At the treatment plant, water temperature is maintained so that the looped distribution systems avoid freezing. Individual services also have built-in circulation systems to avoid freezing. The treatment facilities also provide water for truck haul to homes and businesses that are not connected to piped water systems. Water is stored in above-ground tanks (most often inside homes or businesses). Some homes still bail water for personal use from a large storage container; others, and businesses served by the water deliveries have individual pressurized plumbing systems.

In all communities, new subdivisions and newly constructed homes immediately adjacent to the water and sewer mains are connected to the system. The piped water and sewer system are not immediately expanded to provide service to residences that are not along an existing system. The NSB allocates its capital improvement program funds annually. Residents may wait many years to have their home connected to the piped water and sewer system. In lieu of underground connections, newer homes have holding tanks and truck haul service. Providing truck haul and holding tank service dramatically reduces the financial cost of the piped system.\(^\text{159}\)

**Wastewater Collection**

In all NSB communities, wastewater (greywater and blackwater) is typically collected using a combination of below grade pipe, tank and truck haul, and honey bucket. In Utqiaġvik, some wastewater collection pipe is also maintained in utilidors. The piped wastewater systems are gravity, vacuum, forced main, or combinations of each, with branches to service barrels at individual buildings. The buried wastewater mains and service lines are heat traced to avoid freezing.

\(^{159}\) North Slope Borough. 2012. *Areawide Subdivision Planning.*
Wastewater Treatment

Community wastewater systems are comprised of wastewater treatment plants (WWTP) to process waste delivered through the piped system as well as sewage lagoons to process truck haul and honey bucket waste.

Wastewater collected by the piped system is delivered to a wastewater treatment plant (WWTP), which typically utilizes sludge removal and an extended aeration process for primary treatment. Community systems vary for secondary treatment, using ultraviolet (UV), chemical, some other biologic method, or a combination of these. In some but not all communities, the WWTPs are equipped with an equalization (EQ) basin, which provides short-term storage of untreated waste to allow for more effective operation of the WWTPs during peak flow periods. Each of these systems is subject to a maximum treatment capacity, which differs in each community depending capacity of each plant’s treatment volume. The NSB recognizes that in many communities, the WWTP capacities are not adequate to meet projected flows within the 20 year life of this plan, and is looking for funding streams and options to increase capacity and size to meet the projected population over the next several decades.

The use of sewage lagoons was the traditional method of safe septage disposal until the NSB transitioned to piped wastewater systems and WWTPs. They are still used for septage disposal by those not on the piped wastewater system. Exceptions to the use of sewage lagoons are Utqiagvik, which receives and treats truck haul and honey bucket waste at the WWTP, and Point Lay, where renovations are underway so that it will be capable of receiving and treating truck haul and honey bucket waste.

For those homes and businesses served by truck haul or honey bucket, septage is collected and transported to sewage lagoons, typically located within each community’s landfill area. Sewage lagoon design and discharge events are strictly regulated by the Alaska Department of Environmental Conservation (ADEC). The truck haul waste, which contains anaerobic biological waste, is typically unloaded directly into a sewage lagoon provide biologic treatment prior to the NSB conducting controlled seasonal effluent discharge. The lagoons serve as a septage storage system during frozen conditions.

Sewage lagoons are a permitting and monitoring problem for the borough. Sewage lagoon operations can be extremely problematic as they are directly impacted by seasonal conditions, such as early freeze-up events, high snow years, and late thaw cycles. All of these conditions can increase the potential for uncontrolled discharges of sewage waters onto the tundra or nearby environment, potentially creating human/wildlife heath impacts. In contrast, WWTPs can provide year round treatment of wastewater, including truck haul and honey bucket, if they are properly engineered for this purpose.

Current status, recommended upgrades to the water supply, treatment, storage capacity, or delivery systems for all communities within the North Slope Borough are detailed in Appendix D, Table 40. More expansive information and

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160 Anaerobic bacterial action is when bacteria that do not live or grow when oxygen is present. Comparatively aerobic bacterial action requires oxygen to survive, grow and in the case of WWTP’s break down other media.
explanations of the information contained in this table are available within the individual communities’ comprehensive plan.

Wastewater Upgrades and Improvements

**WWTP Fixed Media**
WWTPs are utilized in all NSB communities but are, in some of the North Slope communities, they are undersized for the current demand and are operating overcapacity. Upgrading or replacing WWTPs is expensive. The WWTP in Kaktovik is currently undergoing an upgrade that installs fixed media into the plant, with the anticipated outcome of increasing plant efficiency by 40 percent. If this pilot upgrade project proves to be a cost effective alternative to a WWTP upgrade and expansion, it can be used in other WWTPs across the North Slope.

**Interim Upgrades**
Many of the village wastewater treatment systems have deferred maintenance on aging infrastructure. While exploring the feasibility of eliminating sewage lagoons and implementing fixed media upgrades, communities will continue to require major maintenance and upgrades to existing systems. Upgrades could also include converting homes back to truck haul service in locations where pipeline maintenance is no longer feasible and addressing pipeline leaks. Pipeline expansion to accommodate homes not currently on the system could also be considered, although this option is often cost prohibitive.

**Periodic Inspections**
Many village WWTPs have been operating without periodic NSB or ADEC treatment system inspections, potentially compromising operator safety and operational dependability and efficiency. Periodic inspections would proactively identify system issues that are able to be repaired through normal repair and maintenance. Without regular inspections, issues are more likely to go unnoticed, increasing the chances of a major system repair or total system failure that increase the potential for significant public health issues. While routine inspections carry an initial high cost for the borough, there is also potential for findings operational efficiencies, creating standardized operation and training procedures, and increasing maintenance actions that are low cost, in turn reducing overall operational costs.

**Independent Utility Systems**
In many villages, independent wastewater treatment systems are being installed in lieu of sewage holding tanks as part of a Cold Climate Housing Research Center initiative to promote off the grid design concepts. Effluent is discharged directly onto tundra. The effluent cannot percolate into the soil because of the permafrost, causing ponding on neighboring properties and environmental issues like odor, erosion, and permafrost degradation. In most cases, these systems have proven to be undesirable for North Slope communities. Due to these environmental concerns, operational requirements for these systems should be developed and incorporated into the borough’s code of ordinances with requirements for meeting village operational and discharge standards. Systems that do not meet these standards should be prohibited.

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POWER GENERATION AND DELIVERY

The North Slope Borough owns and maintains power generation facilities in all of its communities except Utqiagvik, where BUECI operates the power generation facility. Like water and wastewater system, the NSB highly subsidizes power generation, connections, operating costs. Power is managed through the Power and Light Fund. This fund includes the power-generating activities for the North Slope communities of Anaktuvuk Pass, Kaktovik, Nuiqsut, Point Hope, Point Lay, Wainwright, and Atqasuk.

During the 2017 calendar year, expenses to generate and distribute power in the seven North Slope villages were $26,839,423. Residents were charged $8,363,574. The borough also received an operating grant for $132,138. These figures demonstrate that the 2017 subsidy across seven villages was $18,363,574 – the amount that it cost the borough to provide power to residents above the amount received for the service. The approximate 2017 power subsidy per village resident was $6,365. The exact amount depends on the cost of generation and providing service within each village; the cost of operating power plants and distributing power differs between communities. Table 16 provides an overview of eight years of expenses, revenues, and resident subsidies for power service.

Table 16: Power and Light Subsidies

<table>
<thead>
<tr>
<th>Calendar Year</th>
<th>Expenses</th>
<th>Charges for Services</th>
<th>Total Subsidy</th>
<th>Approximate Per Resident Subsidy</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010</td>
<td>$20,228,358</td>
<td>$6,660,172</td>
<td>$13,568,186</td>
<td>$4,476</td>
</tr>
<tr>
<td>2011</td>
<td>$21,537,042</td>
<td>$6,303,426</td>
<td>$15,233,616</td>
<td>$5,026</td>
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<tr>
<td>2012</td>
<td>$25,914,894</td>
<td>$7,946,206</td>
<td>$17,968,688</td>
<td>$5,928</td>
</tr>
<tr>
<td>2013</td>
<td>$27,220,964</td>
<td>$8,702,015</td>
<td>$18,518,949</td>
<td>$6,110</td>
</tr>
<tr>
<td>2014</td>
<td>$27,650,153</td>
<td>$8,685,325</td>
<td>$18,964,828</td>
<td>$6,257</td>
</tr>
<tr>
<td>2015</td>
<td>$26,570,359</td>
<td>$8,467,243</td>
<td>$18,103,116</td>
<td>$6,281</td>
</tr>
<tr>
<td>2016</td>
<td>$27,456,216</td>
<td>$8,459,696</td>
<td>$18,996,520</td>
<td>$6,591</td>
</tr>
<tr>
<td>2017</td>
<td>$26,839,423</td>
<td>$8,363,574</td>
<td>$18,363,574</td>
<td>$6,365</td>
</tr>
</tbody>
</table>

163 For all years except 2017, the approximate subsidy does not include operating grants or contributions that may offset the cost to provide services.
164 The per resident subsidy is calculated from adding the seven village populations from the 2010 NSB Census for the years 2010 through 2015 and the 2015 NSB Census for the years 2015 through 2017.
Power Plants

Within each community, electricity is produced using generators housed in power plants. Anaktuvuk Pass, Atqasuk, Kaktovik, Point Hope, Point Lay, and Wainwright produce power using diesel fired generators. Nuiqsut utilizes natural gas transported via the Nuiqsut Natural Gas Pipeline (NNGP) for primary power generation,\textsuperscript{165} \textsuperscript{166} diesel generation serves as back-up source of power. Utqiaġvik utilizes only natural gas from the Barrow Gas Fields southwest of the community.

NSB-owned power plants are configured with load-sensing switchgear and multiple generators so that electrical demand is met using the most efficient generator or combination of generators. Community power plants are routinely analyzed for efficiency improvements, such as matching generator sizing to demand, to increase operating efficiencies and lower operating costs. These types of improvements are considered a normal part of ongoing operation and maintenance. In some, but not all villages, waste heat from the generators is recovered and used to heat buildings or to maintain water temperature for the distribution loops.

After a set number of hours of operation on each generator, they are rotated for regular service. With continuous maintenance and recommended intermittent major overhauls, the generator life is expected to be well over 100,000 hours of operation, or approximately 11 years.

\textsuperscript{165} The NNGP was designed to provide a maximum flowrate of 3,500,000 cu ft/day of natural gas from the Alpine Development Project (ADP) facilities to the village of Nuiqsut.


Distribution Systems

All NSB communities have overhead electric distributions systems. Utqiaġvik also has some electrical distribution lines within the utilidor system. Distribution systems in all communities except Utqiaġvik are appropriately sized to accommodate projected growth for the 20-year period in this plan, and overhead power is simply a maintenance and repair issue.

The current status and future needs or opportunities for the power distribution networks within NSB communities are detailed within the individual comprehensive plans. Table 43, provided in Appendix D, contains an overview of each community’s power generation and delivery system as well as a summary of the pertinent details of the NSB power demands and forecasts.

Waste Heat Recovery Systems and Expansion

Several NSB communities are experiencing issues with overheating in power plants. There are projects are underway for expansion of cooling systems. Recovering waste heat and utilizing it for heating buildings and maintaining water temperature in delivery systems is a cost effective alternative to expanding power plant cooling systems. In some cases, existing waste heat recovery systems are not being used due to operational maintenance issues. Expanding waste heat recovery systems, and upgrading existing systems will provide economic benefit from both the offsetting effect of substituting heat recovery for other sources of energy and by reducing costs associated with expansion of cooling systems.
Public/Private Collaboration Potential for a Regional Power Center

As oil development pushes west of Prudhoe Bay, and if exploration resumes in the outer continental shelf of the Chukchi Sea, opportunities for partnering with industry and government to foster expansion of roads and infrastructure may arise. Several entities, both public and private, have conducted research into development of transportation and infrastructure corridors within the NSB. A result of any of these potential developments could be road access to communities. Interconnecting roadway development would potentially make the cost of energy interties more feasible.

Standardization of Utilities

The NSB owns and manages electric utilities in all communities except Utqiagvik. Operation, maintenance, and repair of the village systems are conducted by NSB employees or NSB representatives whose training is often utilized in multiple villages. However, the villages’ operating systems are not standardized, making repairs and personnel training more costly. Standardization of system equipment and controls would allow operators to be trained on one system and thus be utilized throughout the communities. Standardization would also allow for parts and service inventories to be acquired in bulk, thereby reducing purchasing costs and repair times. With repair and maintenance training streamlined, service personnel could work on multiple systems without additional site specific training. This could increase local hire employment opportunities as well as save on the costs of importing trained service personnel from elsewhere in the state or U.S.

Standardized systems would also be better suited to centralized systems control. While a centralized control could reduce costs, it could also potentially increase attention to system problems. The feasibility of a remote operation system or remote monitoring system coupled with onsite operation should be researched and vetted.

As-Build Underground Utilities around Power Plants

Upgrades to systems (power and waste heat recovery) in and around power plants often requires exposing and/or placing buried infrastructure. In many cases, underground utilities from and around power plants have not been as-built, leading to costs relating to damaged utilities from excavation, and costs that come from impacts to design and construction costs to allow for unknowns. As-built utilities should be included in future projects for both new construction and upgrades.

SOLID WASTE

The North Slope Borough owns and maintains solid waste landfill facilities in all of its communities. Like other public services, the NSB subsidizes solid waste disposal. Landfills are regulated under Alaska Administrative Code (ACC) 18.60.300, and all facets of operation (solid waste collection, burning, septage collection, etc.) require a permit. Each community has a Class III solid waste landfill, with the exception of Utqiagvik, which has a Class II landfill. The NSB offers different sized dumpsters\(^\text{167}\) to all entities free of charge as a way to promote good waste disposal practices.

\(^{167}\) Oily waste bin/dumpster (20 cubic yards with a liner), landfill bin/dumpster (27 cubic yards), haul all (bear proof) bin/dumpster (6 cubic yards with a lid).
and to help keep the community and surrounding tundra free of refuse and mitigate against any inadvertent health impacts (human or wildlife) through the improper disposal of solid waste.

For fiscal year (FY) 2018 – 2019, the NSB budgeted a total of $5,274,022 for sanitation services for all communities. Residents are not charged for trash pick-up or disposal. The subsidy for providing these services is the total annual budget. The subsidy for this service is approximately $684 per North Slope resident.

The actual cost of providing solid waste services differs by village. The average cost and subsidy per resident is highest in Atqasuk at $1,436 annually. The lowest is Wainwright, at $628 per resident. Solid waste subsidies do not include the substantial cost of constructing and maintaining the landfill or the heavy equipment needed for picking up solid waste and delivering it to the landfill. These costs are bonded through the capital improvements program.

Table 17 provides the cost per village to provide solid waste services.

<table>
<thead>
<tr>
<th>Village</th>
<th>FY 2018-19 Budget</th>
<th>Charge for Service</th>
<th>Total Subsidy</th>
<th>Approximate Annual Per Resident Subsidy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>$350,495</td>
<td>$0</td>
<td>$350,495</td>
<td>$892</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>$356,138</td>
<td>$0</td>
<td>$356,138</td>
<td>$1,436</td>
</tr>
<tr>
<td>Kaktovik</td>
<td>$360,185</td>
<td>$0</td>
<td>$360,185</td>
<td>$1,375</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>$356,742</td>
<td>$0</td>
<td>$356,742</td>
<td>$795</td>
</tr>
<tr>
<td>Point Hope</td>
<td>$2,000</td>
<td>$0</td>
<td>$2,000</td>
<td>Not available</td>
</tr>
<tr>
<td>Point Lay</td>
<td>$270,633</td>
<td>$0</td>
<td>$270,633</td>
<td>$1,006</td>
</tr>
<tr>
<td>Utqiaġvik</td>
<td>$3,232,389</td>
<td>$0</td>
<td>$3,232,389</td>
<td>$670</td>
</tr>
<tr>
<td>Wainwright</td>
<td>$345,440</td>
<td>$0</td>
<td>$345,440</td>
<td>$628</td>
</tr>
</tbody>
</table>

Class II Landfills

In Utqiaġvik, the NSB operates a Class II Landfill approximately nine miles outside of town, as well as a thermal oxidation system (TOS) waste incinerator along Stevenson Street. The Utqiaġvik landfill is permitted to accept the following:

- Municipal solid waste;
- Non-radioactive materials;
- Inert wastes;
- Construction & Demolition (C&D) waste;
- and
- Ash and sludge.

The TOS waste incinerator facility allows incineration of municipal, domestic, and commercial waste prior to landfilling. This process provides for approximately 30 percent reduction in landfill requirements. In recent years, the TOS has been subject of large scale shutdowns and maintenance overhauls as a
result of material disposal placed in dumpster bins that are not permitted to go through the TOS process.

Class III Landfills
A Class III Landfill accepts less than an annual average of five tons of municipal waste. Each Class III Landfill is typically configured with one or more landfill cells for solid waste, cells and/or sewage lagoons for septage, a burn cage (for reducing landfill volume by burning appropriate materials prior to disposal in the landfill), and a storage area for equipment fluids and hazardous waste. Landfill areas are required to be surrounded by a security fence with locked access gates. Typically, the following municipal waste is permitted for disposal:

- Municipal solid waste;
- Inert or Construction & Demolition waste;
- Non-Regulated Asbestos Containing Material (non-RACM); and
- Honey bucket waste or septage.

Community landfills generally do not accept petroleum saturated soils. Those that do must be licensed Class II landfills with ADEC prior to waste placement. None of the village landfills are designed or permitted to accept hazardous waste. The NSB is required to haul large volumes of petroleum-based contaminated soils out of the North Slope Borough to licensed disposal facilities near Fairbanks, Alaska, or the Lower 48.

A general permit (GP) was recently granted by ADEC that allows NSB to permit all of the Class III village landfills under one general or master permit with standardized expiration dates, closure plans, and reporting procedures.

Solid Waste Upgrades and Improvements

Transloading System from Garbage Trucks to Burncages
The village landfill burncages are used sporadically because waste must be manually sorted and then placed in the cages. This practice can be labor intensive and can (when the proper Personal Protective Equipment (PPE) is not worn) expose the individual to unsanitary conditions. By unloading directly onto a transloading belt or other system, waste material is transported directly into the burncage, with sorting taking place during the transload. This would create a system that has the use of the burncage incorporated into offloading operations, and allows for a more time efficient/less labor intensive method. This process of effectively utilizing burncages would reduce waste volume and increase landfill life.

Fence Repairs
Security fencing around landfills is for public safety and is required by regulation. However, many of the landfills are unsecure due to damaged fencing. Fences should be repaired to prohibit access for public safety and for regulatory compliance. The fence repair work should be in conjunction with a snow fencing program so that further damage is mitigated.

Hazardous Material Disposal
Hazardous materials are not permitted in Class III landfills. Hazardous materials can be stored in-village for up to 180 days, and longer with preapproval. Proper disposal methods and locations are reviewed and approved by ADEC. Some hazardous materials can be disposed of in

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169 Alaska Administrative Code. 18.AAC. 60.300 Purpose, Scope, and Applicability: Classes of Landfills.
Utqiaġvik’s Class II landfill upon approval from ADEC.

**Landfill Cover**

Cover must be placed over new waste daily. The cover is typically gravel, however snow is used when available and when gravel is in short supply. Gravel is also required for construction and maintenance of landfill operational pads, landfill access, and for the thicker cap required for closure. In most villages, gravel supplies are insufficient to meet community needs and not available for landfill cover.

**SNOW FENCES**

The North Slope Borough maintains snow fences in all its communities except Nuiqsut. These fences provide barriers to prevailing winds to prevent drifting on or near roads, airports, and other community infrastructure.

There are some concerns about the tundra degradation caused by the accumulated snow on the downwind side of fences:170

- The weight of the snowdrifts compresses the vegetative tundra mat, reducing the insulation protecting the underlying permafrost.

- The snowdrifts do not melt away until mid-summer, reducing the growing season for the vegetative tundra mat within the area of the built up snow drifts. Large concentrations of snow melt can also occur in areas surrounding a snow fence, creating larger bodies of water during the summer that can impact nearby roads, runways or buildings.

- The snowdrifts insulate the permafrost during winter months such that the permafrost does not freeze as cold as adjacent soils.

- Surface permafrost slowly melts and subsides because of the lack of insulation, and depressions form in the tundra. Tundra ponds form in the depressions with poor drainage.

- The snowdrifts reroute melt water into focused drainages that accelerate ice wedge melting, thus deepening drainage channels.

Through careful review and placement evaluation, the NSB can ensure that snow fences are placed in locations and configurations that mitigate impacts. Portable fences that can be relocated to minimize snow accumulations can also be used as needed. Locating snow fences to keep roads landfill entrances clear will improve access. Placing snow fences to generally reduce drifting within the landfill areas will also reduce lagoon flooding and minimize the potential for leaching contaminates into groundwater and reduce fence damage.

**Easements for Existing Snow Fences**

Land fences should be placed in easements with access. New snow fence designs should include site control and access for the entire impact area.

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Damage from Existing Snow Fences
Operational measures such as cutting snow drifts with bulldozers prior to breakup will reduce the impact to the tundra. Other remediation measures such as placing fill and/or tundra mat in damaged areas have been shown to work.

GRAVEL
Gravel and a reliable gravel source is a necessity for all North Slope villages. All aspects of community life depend on gravel: road construction, gravel pads for homes and other buildings, airport runway maintenance, and landfill cover. Without dedicated gravel supplies or source, a community’s ability to grow and expand to meet the needs of its residents is impacted.

The North Slope Borough attempts to maintain stockpiles of gravel in each community. Options for obtaining material, and the quality of material available, varies widely by community. Maintaining an adequate supply of usable gravel is often problematic and expensive.

In all communities, the preferred and most cost effective option for a gravel supply is to mine material from a local source. In some cases, local sources are relatively accessible and sustainable. In the other communities where gravel has historically been mined from locally developed sites, access to gravel is becoming more and more problematic. Mining methods required to extract local material may have simply become too expensive to be feasible. Also, land use regulations have become more and more stringent to prevent environmental degradation. The increased regulatory burden has made material sites either unavailable or unfeasible. Additionally, exploration costs are becoming more and more prohibitive.

In the past, in communities with less accessible and sustainable sources, large-scale gravel extraction operations such as dredging were used to help mitigate mining and stockpiling costs by providing enough material to a community for 20 or more years of demand. The high costs were spread over time to justify the initial capital expenditure. However, these methods are often no longer economically feasible due to the extreme cost of mobilization, operation, and regulatory processes. The need for gravel in communities is so great that gravel utilizing from abandoned activities such as no longer used gravel pads is now considered a viable option. However, this increases the potential for reuse of previously contaminated gravels. Communities throughout the North Slope have various military and federal government infrastructure that is in varying degrees of abandonment. These locations can have vast amounts of gravel, but also have the potential for that gravel to be contaminated from historical spills. The NSB does not allow the use of contaminated gravels or material sources as building materials, significantly reducing the option of re-using already in place gravel supply.

Every year, the NSB is being required to transport tons of gravel out of the communities due to contamination from large and small spills in every community. While small amounts are able to be reused for alternative activities such as landfill cover, or containerized contaminated gravel used for building landfill cell walls, the majority of the contaminated gravel and soil is backhauled to the Lower 48 or to approved sites.

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disposal facilities near Fairbanks. The cost to the NSB is extremely high, as is the cost to haul clean replacement gravel into the community. The ongoing challenge for the NSB is for ways to reduce spills (large, small, drips and drops) from its operations and from residents, so that the amount of contaminated gravel that is in each community is reduced. One way in which to keep the valuable commodity in the communities is through a dirt burner which would enable gravel to be cleaned onsite and reusable to the community. While the startup costs of such an operation are high, a North Slope-based dirt burner would be the most cost effective manner to address petroleum contaminated gravel and soils over the long term.

The cost of developing gravel sites or transporting gravel to a community without a viable source is considerable. A 2014 NSB PAR estimated that transporting gravel from Utqiagvik to Atqasuk via ice road cost between $450 and $600 per cubic yard. Exploration efforts are also costly. In contrast, the cubic yard cost of gravel in Kaktovik was between $19.00 and $42.50; $50.00 in Wainwright; and $4.00 in Anaktuvuk Pass.172

Village residents have often expressed the need to purchase gravel for private use - to shore up driveways, pilings, or other construction needs. Unfortunately, due to the limitations of capital funding through general obligation bonds, the borough is unable to make its gravel available for private use.

The NSB is engaging in partnerships with third party entities to oversee operations of existing gravel mines and/or known mineable gravel deposits within the Prudhoe Bay oil fields. Such mines as PUT 23, Mine Site 3, and Mine Site F afford or will afford the NSB the option of available gravel sources for short term overland gravel hauls. Mines are also within proximity to industry activities that can provide a source of direct income from gravel sales.

Generally, NSB communities need gravel sources that are more reliable and sustainable than what currently exist. Specific details and community needs and the status of gravel sources for each community are discussed in the individual community comprehensive plans.173 Table 45 in Appendix D provides a summary NSB community gravel needs and availability.

Gravel Demand and Inventory
There is a need for singular management of the borough’s gravel sources, inventories, and demand. As departmental responsibility for gravel sources and inventories (supply) differs from responsibility for usage (demand), there tends to be a lag between demand and supply, especially in locations where local material is not readily available. As a result, gravel exploration has tended to be in reaction to shortage, as opposed to being in anticipation of shortage. The planning window required to locate, fund, and mine material is a multi-year process that should begin well in advance of a shortage. By combining responsibility for supply with demand, there is potential for a more forward looking management of gravel resources.

Regional Gravel Sources
In accordance with Title 19 of the NSBMC, which aims to consolidate and reduce habitat pockmarking when mining for gravel, the NSB Planning & Community Services Department has initiated a program to develop regional gravel sites. The purpose of the program is to minimize environmental impacts that are caused by creating multiple project-specific material sources, including mining in active river channels. The concept of regional gravel sources holds potential for minimizing the financial, environmental, and administrative impacts associated with ongoing exploration and development of local area sources. A regional site which is pre-permitted would have in-situ material available as needed, and could also have gravel materials stockpiled for immediate availability so that communities can access supply when cost effective opportunities arise.

Local and Regional Gravel Supply Partnerships
As oil development pushes west of Prudhoe Bay, and if exploration resumes in the outer continental shelf of the Chukchi Sea, opportunities may open up for partnering with industry and government to foster expansion of roads and infrastructure. Entities, both public and private, have conducted research into development of transportation and infrastructure corridors within NSB. A result of potential North Slope industry development could be regionalized material sources and/or road access to communities. Either of these could result in substantially lower costs for gravel source, and improved sustainability.

Gravel Alternatives
There are potential alternatives to gravel that would lower gravel demand and potentially lower overall costs of operation. For example, using polyethylene sheets to meet daily cap requirements at landfills would certainly reduce gravel consumption and may actually be more cost effective than a gravel cap. Also, the availability and cost of gravel should be incorporated into capital project designs with an evaluation of gravel alternatives.

COMMUNICATIONS
Telecommunication reliability and services throughout the North Slope can be challenging and are dependent on weather and environmental factors including wind and snow storms, sun spots, and sun flare activity, all of which have the capacity to interrupt satellite signals and reception needed for communication throughout the North Slope.

Telecommunications facilities serving the North Slope include a fully digital local exchange telephone service, local dial-up internet, cellular telephone, cable television, public radio broadcast, and teleconferencing centers. Interconnection with the regional and global telecommunications network is via satellite circuits. The Arctic Slope Telephone Association Cooperative (ASTAC) provides in-state and long-distance telephone service to residents throughout the North Slope Borough. AT&T Alascom, Alaska Cellular Service (ACS), and GCI (General Communication, Inc.) provide long-distance telephone service. The Alaska Teleconferencing Network provides NSB and City of Utqiagvik teleconferencing services to the villages, thereby facilitating greater real-time interaction between NSB offices in Utqiagvik and area communities, while providing cost savings on travel needed over the course of business activities.
In February 2018, Quintillion announced that its subsea fiber optic cable system was in service in five northern Alaska communities: Prudhoe Bay/Oliktok Point, Utqiagvik, Wainwright, Point Hope, Kotzebue, and Nome. ASTAC has also recently upgraded its internet services and capacity in Point Hope, Wainwright, Utqiagvik, and Nuiqsut to fiber optic cable, the fastest internet medium that exists today. In addition to their subsea fiber optic cable system, Quintillion completed installation of their new terrestrial fiber optic system between Fairbanks and Prudhoe Bay, thereby providing a fiber optic connection for the first time for some North Slope communities. Future fiber optic plans for the North Slope include connections to Asia and to Western Europe via the Northwest Passage. The North Slope Borough is also closely following the development of satellite-based broadband internet providers such as OneWeb and SpaceX that are competing to be the first in providing seamlessly integrated global data at fiber optic comparable speeds, through a constellation of micro-satellites that may provide improved connectivity.

Although existing communications systems in the NSB appear to be adequate to meet emergency communication needs, telephone, cellular telephone, and internet systems are substandard when compared to communities in southcentral Alaska and beyond.

Terrestrial High-Speed Fiber Optic Networks to Inland Communities
Quintillion connected the coastal communities of Point Hope, Wainwright and Utqiagvik to the fiber optic network available at Prudhoe Bay. Opportunities for funding to connect additional North Slope communities to high-speed fiber optic internet. Such funding opportunities and guidance may exist through the Statewide Broadband Task Force or the Alaska Department of Commerce, Community and Economic Development (DCCED).

Improved Communications Systems
There are continuous advancements in providing inexpensive and stable high-speed connectivity. The feasibility of implementing new technologies to improve connectivity on the North Slope should be a priority.

ROADS AND AIRPORTS
These very important public facility capital assets are detailed in the transportation chapter of the Comprehensive Plan.

SUBDIVISION DEVELOPMENT
In 2012, the NSB compiled the costs to extend connections to vacant residential parcels and expand roads and services to platted subdivisions in each community. This evaluation documented the costs associated with road construction, utility installation, water/sewer connections, and gas and electric connections costs along with anticipated gravel needs. This information is vital to informed decisionmaking when expanding public services. Through this evaluation, the NSB determined that to extend roads into already platted subdivisions and provide service connections for water, sewer, gas, and electricity cost an average of $491,923 per lot in 2012. Adding an escalation cost of 2 percent per year since 2012 results in a 2018 average cost of providing road access, water, sewer, electricity, and natural gas to vacant parcels and platted subdivisions in North Slope communities’ costs approximately $553,985 per
lot. Overall, extending roads and installing underground water and sewer systems are the largest costs associated with developing subdivisions on the North Slope.

The cost to extend infrastructure varies by community; the most expensive per lot cost in 2012 was Point Lay at $820,891 per lot and the least expensive was Kaktovik at $317,203 per lot. There are several reasons for the variations in cost by community. Some communities already have extended roads to new subdivision(s) and the cost to extend some residential roads and utilities is the only consideration in this study, such as in Kaktovik. The number of platted lots available for expansion in some communities is low; therefore the total cost of extending roads and other utilities is averaged over only a few lots which increases the per lot cost, such as the case for Point Lay. Other communities, like Utqiaġvik, have many platted lots to average the potential cost of infrastructure expansion. Other communities, like Atqasuk, have a shortage of gravel that must be considered when calculating the costs to extend services. Table 18 provides an overview of the cost for subdivision development in each North Slope community.

Local residents and businesses are charged the same fee for services as non-residents. For example, contractors, working on behalf of NSB, state or federal agencies, or private interests are authorized to dispose of contaminated materials in community landfills that are owned and operated by the North Slope Borough. A potential source to offset the high costs for the NSB to provide services is through a resident/non-resident and/or usage fee schedule.

Table 18: 2012 NSB Subdivision Development Costs by Community

<table>
<thead>
<tr>
<th>Community</th>
<th>No. of Lots</th>
<th>Street Front (mi.)</th>
<th>Road &amp; Utility Infrastructure (per lot)</th>
<th>Water / Sewer Service (per lot)</th>
<th>Natural Gas Service (per lot)</th>
<th>Electric Service (per lot)</th>
<th>Subtotal Cost (per lot)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>40</td>
<td>0.86</td>
<td>$521,248</td>
<td>$108,000</td>
<td>–</td>
<td>$2,100</td>
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<td>Atqasuk</td>
<td>63</td>
<td>1.21</td>
<td>$275,967</td>
<td>$108,000</td>
<td>–</td>
<td>$2,100</td>
<td>$386,067</td>
</tr>
<tr>
<td>Kaktovik</td>
<td>129</td>
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<td>$207,103</td>
<td>$108,000</td>
<td>–</td>
<td>$2,100</td>
<td>$317,203</td>
</tr>
<tr>
<td>Nuiqsut</td>
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<td>2.81</td>
<td>$449,033</td>
<td>$108,000</td>
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</tr>
<tr>
<td>Point Lay</td>
<td>4</td>
<td>0.15</td>
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<td>$108,000</td>
<td>–</td>
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<td>$820,891</td>
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<td>Point Hope</td>
<td>24</td>
<td>0.61</td>
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<td>–</td>
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<td>Utqiaġvik</td>
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<tr>
<td>Wainwright</td>
<td>14</td>
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<td>$108,000</td>
<td>–</td>
<td>$2,100</td>
<td>$580,542</td>
</tr>
</tbody>
</table>

COMMUNITY INPUT, FINDINGS, NEEDS, AND CHALLENGES

Residents rely heavily on public services provided the North Slope Borough. There are not competing organizations to provide service to residents if the borough was unable to provide it. The borough also highly subsidies many of the services provided to residents, including water and wastewater service, energy, and solid waste disposal. In addition to subsidizing services, the borough also finances the cost of construction, upgrades, renovations, and maintenance of all public facilities.

Public facility issues and concerns identified by workshop participants are provided in Chapter 2 and listed below:

- Dependence on fossil fuels and logistics of fuel delivery
- Too much reliance on borough services
- Lack of redundancy
- Aging infrastructure
- Aging health infrastructure
- Abandoned infrastructure
- Deferred maintenance
- Shortfall in capital funding
- Bond expense eligibility / bond rating and capacity; tax vs debt capacity
- Revenue is not keeping up with cost of capital maintenance or replacement
- Lack of renewable / alternative energy sources
- Lack of standardization in current construction and in technology
- Lack of current technology and technology standardization in infrastructure
- Infrastructure is sometimes over capacity and needs to expand but there is a lack of funding
- The existing access to piped water and sewer system is not being fully utilized
- Engineering difficulties due to climate change, the inability to adapt in a timely manner, and insufficient funding
- Continued change in maintenance software programs; consistency is needed
- Lack of search and rescue facility space in villages
- Need for a regional power plant
- It is expensive to construct roads to lots and connect homes to services
- Building design standards for the Arctic are yet to be implemented and enforced
- Utilize existing vacant or underutilized lots that already have road access and proximity to piped water/sewer
- Coastal erosion
- Distance between villages and communication system
- Many [education] buildings and other infrastructure need to be updated and renovated due to their age
### Needs & Challenges

Maintaining borough assets is a priority and capital expansion should be limited.

The borough highly subsidizes services for its residents.

Implementing a system of standardized equipment and controls and a centralized system control could be beneficial.

Streamlined training for personnel operating and maintaining public infrastructure.

Water and wastewater system expansions to connect additional homes are needed.

Subsidence has greatly affected the integrity of the underground water and sewer systems.

WWTP capacities are not always sufficient and may need expansion depending on the success the mixed media pilot project in Kaktovik.

Potentially abandon failing piped systems and return to truck haul service where appropriate.

### Findings

NSB owns and operates $4.2 billion in public facility assets.

The cost to provide services across the North Slope is substantial and the cost to residents is highly subsidized.

Much of utility and road expansions are cost restrictive / prohibitive.

There is a need to develop alternative/secondary water sources

There is a lack of utility standardization.

Independent utility systems are problematic and should be restricted until regulations are developed

Upgrades and deferred maintenance needs to be addressed systemwide.

Wastewater treatment plans must have regular system inspections.
PRIMARY PUBLIC FACILITIES GOALS

Goal Seven: Provide essential public infrastructure and services.

Objective 1: Seek program improvements to better maintain infrastructure and consolidate and share services.

7.1.1. Implement a program for consistency and standardization of utilities in general, and utility technology, construction, and maintenance software programs specifically, for easier maintenance and upgrades.

7.1.2. Focus oversight of gravel inventories and demand within NSB to a single department or division to better coordinate inventories and needs.

7.1.3. Investigate consolidating facilities that provide similar or the same operations or services, such as NSB and NSBSD maintenance and operations facilities and general office space.

7.1.4. Facilitate shared use of village facilities to benefit all village residents, such as community use of school swimming pools and other recreational space.

7.1.5. Avoid expanding the borough’s services and infrastructure until deferred capital maintenance and replacement needs are met.

7.1.6. Regularly update and maintain the NSB Repair and Replacement Schedule to better understand and plan for maintenance and replacement needs.

7.1.7. Seek innovative ways to coordinate or consolidate infrastructure, such as constructing one ice road and accessing a toll for industry use.

7.1.8. Research potential ramifications of climate change on the region’s infrastructure and plan accordingly.

7.1.9. Emphasize compactness in community development during project planning to minimize operations, maintenance, and expansion costs of community infrastructure.

7.1.10. Prohibit independent utility systems and connections to municipal utility systems until guidelines are in place for local service area development.

7.1.11. Develop a program to confirm easements in place for existing snow fences and other public infrastructure.

7.1.12. Evaluate alternative options to gravel to aid in fulfill community gravel needs.
Objective 2: Address current critical infrastructure needs and plan for future needs.

7.2.1. Develop alternative/secondary water sources to ensure continued availability.

7.2.2. Proactively maintain roads that provide access to critical infrastructure, such as the landfill, water source, or natural gas facilities.

7.2.3. Proactively protect critical infrastructure from unforeseen events, such as flooding and storm events.

7.2.4. Renovate or demolish NSB-owned facilities and infrastructure that are beyond their useful life and coordinate with other agencies to renovate or remove dilapidated infrastructure where needed.

7.2.5. Seek equity in village infrastructure and facilities.

7.2.6. Invest in heavy equipment repairs and replacement and transport replaced equipment out of villages.

7.2.7. Assist local efforts to secure search and rescue facility space in the villages.

7.2.8. Investigate alternative technologies for supplying improved communications systems.

7.2.9. Enhance current communications networks within villages to maximize improved subsea fiber optic connections.

7.2.10. Seek funding for development of terrestrial high-speed fiber optic networks to inland communities.

7.2.11. Coordinate with educational institutions on technology needs.

Goal Eleven: Increase education and employment opportunities for all residents.

Objective 3: Evaluate future capital needs to meet educational demand.

11.3.1. Assist Ilisaġvik College in seeking funding to construct a new facility in Utqiagvik to better meet their needs.

11.3.2. Assess village educational space equity and future needs and plan accordingly.
11.3.3. Improve Native language fluency through partial or full immersion programs from pre-kindergarten through high school.

11.3.4. Seek funding and opportunities to assist fluent Iñupiaq speakers to become certified teachers.

11.3.5. Encourage the North Slope Borough School District and educators to further incorporate traditional and cultural values throughout the school curricula.

11.3.6. Integrate Elders into school activities through shared lunches, invitations to speak with classes, and involvement in student projects.

11.3.7. Teach traditional values to new generations by highlighting local success stories and how traditional and cultural values assisted in their success.

Goal Thirteen: Ensure government efficiency and accountability.

Objective 1: Revaluate state and federal obligations in community health, social services, and security.

13.1.1. Keep up with advancement of technology.

13.1.2. Pursue funding from Bureau of Indian Affairs, State of Alaska, Denali Commission, Housing and Urban Development, and federal transportation funds for housing and transportation needs.

13.1.3. Continue effective hazard planning to protect the North Slope community and subsistence resources from natural disasters.

Objective 2: Rediscover our founders’ intent as a home rule borough.

13.2.1. Measure government performance and make information available to the public.

13.2.2. Focus on consistent and effective enforcement of borough laws and regulations.

13.2.3. Review options to ensure that local resources are deployed in the most cost effective manner to help achieve the community’s vision and goals for the future.
Chapter Eight
Service Area 10
CHAPTER 8: SERVICE AREA 10

The North Slope Borough established Service Area 10 in 1975 with the objective of providing utility services to industrial users in the Prudhoe Bay area. Service Area 10 is managed by the North Slope Borough and encompasses the area generally between the National Petroleum Reserve-Alaska and the Arctic National Wildlife Refuge and extends from the Beaufort Sea south to 70° latitude. After creating Service Area 10, the Borough Assembly made provision for a solid waste collection and disposal district and a sanitary waste collection and disposal district in the area. SA-10 encompasses approximately 3,000 square miles. There is not a residential community in Deadhorse or the Prudhoe Bay region. Workers in the region reside there on a part-time, nonpermanent basis and travel to the region specifically for work in oil and gas industry. Few North Slope residents are employment in the Prudhoe Bay area.

The borough code stipulates that in setting utility rates, the borough should be compensated to support debt service for capital expansion of utilities projects initiated after January 1, 1982 and for other expenses, including operations and maintenance cost. Debt service for capital committed to the utilities prior to that date was not to be included in the utility rates. Utility have rate been established through the Regulatory Commission of Alaska for the last 15 years.

SA-10 originally also included the NSB built Kuparuk Industrial Center (KIC), a $65 million, 60,000 square foot facility including a 250 man camp and recreation facilities, a 24 acre outside storage pad and wastewater treatment facilities. The facility was constructed in 1984 on land leased from the State of Alaska and selected by the NSB under the Municipal Land Entitlement program. The facility was operated by a consortium of local Native corporations to provide utility services in the newly developed Kuparuk River Unit. Low oil prices and an economic downturn in the early 1990s lead to the sale of the facility to ARCO (now operated by ConocoPhillips). The land under the facility was conveyed to the borough in 2010 and is leased to ConocoPhillips, Inc. (CPAI).

The ordinance which established Service Area 10 specifically stated that that the services provided by the borough to this area might be on a different level than those provided on an areawide basis elsewhere in the borough. Aside from the exercise of general borough powers, the only services currently provided by the borough in Service Area 10 are police protection and management of borough owned lands. The borough assumed areawide police protection responsibilities in 1976, and has had regularly assigned public safety officers to the region since 1979.

In 1979, the NSB built a 15,000 square foot camp for 32 NSB employees living or working in the Prudhoe Bay area. The original facilities were expanded to over 37,000 square feet in 1982 to accommodate 68 persons with expanded dining and recreation areas along with retention cells and related facilities to support the NSB Department of Public Safety. The building also

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175 The Alaska State Troopers began servicing the Prudhoe Bay area in 1974 and ceased regular assignment in 1983 when the position was relocated to Utqiagvik to assist the State Court System.
houses the NSB police station and jail. The SA-10 hotel is now operated commercially. Since 2004, a contractor has operated the water and wastewater treatment facility and hotel. These facilities are co-located on a common pad in Deadhorse. Since 2009, the same contractor, ICE Services, has provided the SA-10 water, wastewater, and hotel services.\textsuperscript{176, 177}

Renewed activity in the western fields and the potential opening of the Arctic Nation Wildlife Refuge 1002 area have renewed interest in development of facilities to support oil and gas development and should be considered in planning for future activities.

\textbf{WATER AND WASTEWATER SERVICES}

The water treatment system was originally constructed by the Borough with capital improvement funds and activated in 1979. Prior to construction of the borough water treatment system, it was necessary for each camp in the Prudhoe Bay/Deadhorse area to provide its own water treatment plant and to rely on local lakes or rivers for raw water supplies. Some of the original systems were poorly designed and/or operated. The Alaska Department of Environmental Conservation was concerned about the possibility of water contamination under these circumstances and encouraged the development of a central water treatment and delivery system. A number of treatment plants are still being operated by individual camps.

\textbf{Water Treatment}

The SA-10 water treatment facility receives raw water from a pump station in Nana Reservoir, through a short section of insulated heat-traced pipe, to the treatment facility. A portion of raw water is filtered, stored on-site, and is available as non-potable water for pick-up. Water not stored for pick-up is treated in the water treatment facility that combines membrane treatment with UV and chlorine disinfection. Treated potable water is transported to water delivery stations where it is stored for pick-up for delivery. As an emergency back-up to the reservoir pump station, three slant wells are in place to supplement the reservoir water source if necessary. The water from the wells have a high iron content. Another treatment train to remove the iron would have to be added to the facility in order to use water from the wells.

\textsuperscript{176} The North Slope Borough has certificates of public convenience for wastewater and landfill service in the service area. NSBMC sec. 15.06.130 provides that these services should be used by all users in the service area, unless a waiver is granted by the mayor.

\textsuperscript{177} North Slope Borough. 2018. Service Area 10: Commitment to Partnership Presentation. 2018 Oil and Gas Forum.
SA 10 Water Treatment Plant:
- Current Treatment Capacity
  230,000 gallons per day
- Current Storage Capacity
  250,000 gallons of potable water
  120,000 gallons raw water
- Delivery method
  Water truck pick up
- Water source
  Nana Reservoir
- Treatment method
  GE membranes
- Current demand
  80,000 average of gallons per day

Wastewater Treatment
Wastewater is treated in the wastewater treatment facility comprising sequencing batch reactors (SBRs), tertiary filtration, and UV disinfection. Sludge from the wastewater treatment process is dewatered via belt filter presses before it is delivered to the SA-10 landfill. Sludge not generated in the wastewater treatment process is discharged directly to the belt filter press (BFP). A portion of the treated effluent is used as influent to the heated water system and the rest of the liquid stream is discharged into an outfall pond.

SA 10 Wastewater Treatment Plant:
- Current Treatment Capacity
  420,000 gallons per day
- Delivery method
  Vacuum truck

- Treatment method
  Activated Sludge using sequence match reactors SBRs
- Disposal method
  Discharge to lake
- Current demand
  55,000-65,000 average gallons per day

Water Heating
Hot water is needed for some oil drilling operations. The plant began offering on demand hot water in 2015. A combination of raw water and wastewater treatment effluent is heated with three natural gas boilers and delivered directly to the customer’s truck for pick-up. There is limited demand at this time due to a current slowdown in oil field activities.178

Water and Wastewater Demand
The demand for water and wastewater services varies from year to year depending on the activity of the oil and gas market. Table 19 summarizes historical flowrates of potable and non-potable water, and wastewater, and sludge treatment. Heated water is not included because it has only recently become available. Permitted flowrates are shown for water and wastewater and maximum flowrates are presented for sludge and heated water.

### Table 19: Historical and Design Flowrates for Water and Wastewater Treatment Facility

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>420,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Potable Water</td>
<td>124,900</td>
<td>168,500</td>
<td>127,400</td>
<td>137,000</td>
<td>166,900</td>
<td>127,081</td>
<td>108,989</td>
<td>85,163</td>
</tr>
<tr>
<td>Non-potable Water</td>
<td>25,000</td>
<td>31,200</td>
<td>31,800</td>
<td>35,600</td>
<td>33,200</td>
<td>29,299</td>
<td>37,111</td>
<td>35,489</td>
</tr>
<tr>
<td>Wastewater</td>
<td>111,000</td>
<td>161,400</td>
<td>104,700</td>
<td>112,900</td>
<td>132,100</td>
<td>115,801</td>
<td>95,041</td>
<td>70,639</td>
</tr>
</tbody>
</table>

### Area Needs – Water and Wastewater

The water and wastewater treatment systems were almost new in 2015 and, other than stated below, should provide adequate service through the plan period. Treatment capacities appears to be adequate to meet future demand, barring a major upturn in oil field activity.

**Water Treatment**

- Add treatment train to remove iron from back up wells. Normally scheduled membrane replacement.

**Wastewater Treatment**

- No major repairs foreseen.

### Hotel Services

In addition to water and wastewater services, there are also hotel services available in SA-10, including accommodations, and meals and snacks. The hotel also provides NSB a two room suite to serve as an office for the hotel and a second office space used as a police station and jail. The hotel has a kitchen, two dining rooms, guest laundry rooms, a smoking room, and a workout room.

In 2006, the contracted operator increased the number of hotel rooms from 77 to 149. NSB owns the original 77 rooms at the hotel (includes 40 twin, 30 full, and 2 queen beds). The additional 72 rooms are a separate building that is now connected to the original hotel and are owned by the current contractor, ICE Services. In addition to constructing additional rooms, ICE Services constructed a utilities building that provides electricity, water, and sewage services to the hotel. The current contractor may elect to remove the rooms and utilities building if the NSB operating contract is awarded to another contractor. Table 20 summarizes the original 77 rooms owned by NSB.

**SA 10 Hotel/Camp**

- **Current Capacity:** 140 rooms (includes NSB rooms and ICE rooms available for rent)
- **Current Services provided:** Meals, internet, television, phone

**Hotel Occupancy**

The hotel accommodates guests and NSB staff. ICE Services also utilizes the hotel for their rotational staff that work at the water and wastewater facility. The hotel also provides, on occasion and if rooms are available, accommodations for NSB residents for up to
three days on a complimentary basis as well as complementary rooms for those who require accommodation on a short-term basis, such as for weather-related flight delays.

Like water and wastewater services, demand for the hotel’s accommodations fluctuates with activity in the oil and gas industry. Table 20 summarizes the hotel occupancy (includes rooms in the 72 room addition).

Table 20: SA-10 Hotel Occupancy based on Revenue

<table>
<thead>
<tr>
<th>Hotel Rooms</th>
<th>2014</th>
<th>2015</th>
<th>2016*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Available Room Revenue</td>
<td>$58,035</td>
<td>$58,035</td>
<td>$50,721</td>
</tr>
<tr>
<td>Occupied Rooms</td>
<td>$54,950</td>
<td>$48,122</td>
<td>$39,543</td>
</tr>
<tr>
<td>Occupied Rooms Excluding Non-Revenue Rooms</td>
<td>$38,340</td>
<td>$29,953</td>
<td>$23,741</td>
</tr>
<tr>
<td>Occupancy Percentage</td>
<td>94.7%</td>
<td>82.9%</td>
<td>78.0%</td>
</tr>
<tr>
<td>Occupancy Percentage Excluding Non-Revenue Rooms</td>
<td>66.1%</td>
<td>51.6%</td>
<td>46.8%</td>
</tr>
</tbody>
</table>

* 2016 represents year-to-date November 16, 2016.

Area Needs – Hotel

No major repairs foreseen. Normally scheduled room remodels and carpet replacement. Room capacity appears to be adequate to meet demand through the plan period, barring a major upturn in oil field activity.

Solid Waste Facilities

During the initial development of the Prudhoe Bay area, solid waste was not managed as strictly as current guidelines require. An early disposal site, the Sand Dunes dump, was ordered closed by ADEC. ARCO subsequently undertook the design of a new landfill at the gravel site it was mining near the Putuliquyak River. The North Slope Borough assumed responsibility for the final design and development of the landfill after reaching an agreement with ARCO. The Oxbow landfill operation was assumed by the borough in 1981, following the delivery of the necessary heavy equipment for the site’s operation. The land at which the gravel site was developed was not originally owned by the borough, but was leased from the State of Alaska. The NSB municipal code was also amended that year to require all owners or occupiers of premises located in the solid waste district to use and pay for the garbage and solid waste collection and disposal systems provided by the borough. Exceptions to this requirement are only allowed following a waiver being granted by the Mayor.

The SA-10 landfill is now owned by the NSB, following state conveyance of the land in 1996.

and is located approximately 6.8 miles northwest of Deadhorse. By 2009, the landfill was nearing capacity and was in danger of closing. In 2011, additional lands to the south of the Oxbow landfill were conveyed by the State of Alaska, allowing for a much needed expansion of the site to satisfy customer needs. It has been accepting solid waste disposal resulting from industrial development activities in Greater Prudhoe Bay, Kuparuk, Alpine, and Point Thomson areas for over 30 years. In addition to the landfill, there are support facilities at the site, including the maintenance and storage shop, waste reduction facility building that includes incinerators, generator building, diesel fuel aboveground storage tank, and perimeter fencing.\(^{180}\)

The SA-10 Landfill is permitted as a freezeback landfill, meaning that operations rely on the containment properties of frozen ground to contain the waste and leachate without a bottom liner and leachate collection systems. Operator measurements from the thermal monitoring wells show that the existing waste can be maintained in a permanently frozen condition with the proper placement of final cover and closure of the landfill. The resulting encapsulation of waste will maintain the 32° F isotherm within the cover material. Material and waste below this isotherm will remain frozen. Soil temperatures around the landfill are monitored to ensure compliance.

The main area of the SA-10 landfill is approximately 24.6 acres and surrounded by a security fence. The total design capacity of the landfill is estimated at 3,135,000 CY. The landfill will be at capacity by 2018, and closure of the existing landfill and landfill expansion are currently in progress.

The landfill site has an existing maintenance shop building that houses the operator office, scale ticketing, restroom facilities, potable water, and equipment maintenance bay. Adjacent to the shop building sits an intermediate fuel tank, power generation building, and fuel dispensing tank. The waste reduction facility, a building designed to house a future incinerator and tipping floor is west of the shop building.

The existing waste reduction facility (WRF) was designed in 2008 by ASCG, Incorporated to provide a building for future incineration equipment. The facility was partially

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constructed shortly thereafter. The existing facility consists of an insulated building shell, foundation, and minimal electrical and mechanical equipment. The design includes a tipping floor with roughed-in in-floor heat, recessed incineration bay for housing future incinerator chambers, an equipment floor area for future exhaust and ash handling equipment and supports, and a partial mezzanine for a future control room and restroom facilities. The control room and restroom wall framing are in place, unfinished. The equipment bay floor is currently exposed gravel to allow for installation of foundations for future equipment support structures to support the ash handling and exhaust equipment. Identifying appropriate alternatives for waste reduction/minimization are a critical factor in developing future plans for the landfill.

Landfill Expansion
The existing landfill is nearing capacity and is scheduled to be closed and capped in 2019. A new lateral expansion to the existing landfill has been developed to ensure uninterrupted solid waste disposal for the SA-10 region. NSB has developed a 22-acre expansion site, but has designed and permitted a total of 40-acres for future expansion. Based on projections of future waste streams into the landfill, this initial landfill expansion should allow for eight years of operations without need for further expansion. Future development of the remaining acreage will be necessary to allow for 20 years of capacity. This phased expansion will allow the most flexibility in operation and provide some savings in overall expansion costs. The NSB installed two small incinerators at the landfill as part of the recent landfill expansion project. However, the incinerators are not permitted under Title 5 of the Clean Air Act, and will not be operated. Older incinerators, which the new incinerators were intended to replace, are not in compliance with current regulatory standards and have also been taken out of operation. At this time, it is anticipated that incoming waste will not be incinerated and the projected life of the landfill will reflect that. However, anticipated industrial activities in the east (associated with Point Thompson and ANWR 1002 development) and in the west (Nanushuk and NPR-A development) should be considered in planning for future activities and the current planned capacity of the Oxbow facility. Future DR&R needs also need to be factored into planning efforts for solid waste disposal in the long run.

Area Needs – Solid Waste
Current upgrades to the solid waste facilities include a new warm storage building, a new landfill expansion cell, and assorted other improvements/upgrades that will allow the landfill to operate adequately well into the future. Other than the planned expansion discussed below, no major upgrades are currently planned.181 182

Future Landfill Expansion
Initial projections of future waste streams into the landfill estimated that the initial landfill expansion should allow for eight years of operations without need for further expansion. However, due to a recent slowdown in oil field activities in the Prudhoe Bay area, it is now thought that the initial expansion should provide

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for disposal beyond the initial estimate. This phased expansion will allow the most flexibility in operation and provide some savings in overall expansion costs in the Prudhoe Bay area, but other solid waste needs must be addressed.

**Area Needs – SA-10 Enterprise Zone**

Overall, the SA-10 facilities have all been recently upgraded, or are in the process of being updated. However, as SA-10 is an enterprise zone, these facilities are being operated with the expectation of generating profit back to NSB and provide a very necessary service to the oil and gas industry. As such, fiscal tools associated with for-profit enterprises, such as rate studies, internal financial audit and budget review, etc., should be incorporated into the management of each facility, if these tools are not already utilized.

Utility needs in the area of current and future oil and gas development are an important issue in address the planning efforts of the North Slope Management Plan (NSMP) that is underway with the State of Alaska Division of Mining, Land, and Water (DMLW). The borough must consider these issues in planning for not only utility needs but other infrastructure development to support both the local and state economies. Land conveyance to the borough for these needs is very important, given that the federal government is the land manager in both ANWR and the NPR-A. Future expansion of the service area and its services must be coordinated with the lease holders (and other customers) in the area and the management and regulatory agencies that are closely involved in managing the resources.

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North Slope Borough
SA-10 Deadhorse Area Facilities
Map 7

Image Source: DCRA Community Mapping 2014
North Slope Borough
Deadhorse WWTP
Map 8
COMMUNITY INPUT, FINDINGS, NEEDS, AND CHALLENGES

During the public input process, residents did not discuss specific issues or concerns relating to Service Area 10. As the only local governmental entity in the Prudhoe Bay region, however, the borough’s input and involvement in the area is essential. Providing services to industry has been a borough role for over forty years. With potential expansion into ANWR, that role may be increasing to provide additional services and over a larger area.

<table>
<thead>
<tr>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>The North Slope Borough established Service Area 10 in 1975 with the objective of providing utility services to industrial users in the Prudhoe Bay area.</td>
</tr>
</tbody>
</table>

Service Area 10 takes in the area lying generally between the National Petroleum Reserve-Alaska and the Arctic National Wildlife Refuge and extends from the Beaufort Sea south to 70° latitude.

Service Area 10 provides hotel accommodations, water and wastewater, hot water, and solid waste services.

<table>
<thead>
<tr>
<th>Needs &amp; Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>A landfill expansion is needed.</td>
</tr>
<tr>
<td>There is potential to provide additional services in ANWR 1002 to support exploration and development.</td>
</tr>
</tbody>
</table>

PRIMARY SERVICE AREA 10 GOAL

Goal Eight: Partner and collaborate with Industry for the benefit of borough residents.

Objective 1: Ensure Service Areas are keeping up with industry needs.

8.1.1. Investigate the need and feasibility to establishing an additional service area to support expansion into ANWR 1002 area of new oil exploration and production.

8.1.2. Investigate the need of expanding Service Area 10 and offering additional services to users.
Chapter Nine
Transportation
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CHAPTER 9: TRANSPORTATION

The Iñupiat of Alaska’s North Slope have always maintained a mobile culture, traveling over great distances through a harsh climate. In the past, modes of travel were on foot, by dog teams, or kayaks or umiat.

Traditionally, the Iñupiat lived in semi-permanent coastal communities. In April and May, Iñupiat hunters from Point Hope, Wainwright, and Utqiaġvik would search for bowhead whale, en route to summer feeding grounds in the Beaufort Sea. At this same time, hunters would occasionally travel along the upper Utukok and Colville rivers in search of caribou. In June and early July when the ice left, coastal Iñupiat traveled to seal and duck hunting camps while those living inland would move to coastal areas. In July, another major move occurred to the fish camps or inland to hunt caribou. Historically, Iñupiat would travel other times of the year for regional gatherings, like the Messenger Feast, where families from different areas whose leaders either were trading partners or linked by co-marriage, traveled to meet in a ceremonial gathering. Iñupiat would also travel to visit relatives. During the summer months, travels may also head eastward to the trade fairs at Nigliq, at the mouth of the Colville River.

Today, traveling over long distances is easier; airplanes, ATVs, snow machines, and boats with outboard motors provide the more efficient means to reach distant arctic communities. While more convenient, these new modes of transportation have brought many changes to the people of the North Slope and continue to present challenges as these communities strive to improve and maintain a diverse transportation system.

Transportation plans are often developed separately from comprehensive plans, as standalone yet complimentary and fundamentally linked documents. This North Slope Borough transportation plan is imbedded within the regional comprehensive plan because transportation is rarely a singular issue in the North Slope; the region’s remoteness and lack of connectivity to the rest of Alaska affects nearly all aspects of residents’ lives. This chapter outlines NSB transportation issues identified through research and by borough residents and local leadership during village comprehensive planning meetings, the areawide plan SWOT workshops, and interviews with stakeholders.

TRANSPORTATION PLANNING BACKGROUND

Since its inception, the borough has enjoyed the benefits of the significant tax base provided by oil and gas development. Because of this tax base, investments in transportation and other

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185 Ibid
public infrastructure over the last four decades have been significant within the communities. As a home rule borough, the North Slope Borough may assume transportation related responsibilities that are within the borough’s fiscal resources to accomplish. Below is a list of the more significant events, activities, and regulations or policies that have influenced transportation planning on the North Slope.

1979 Interim zoning ordinance adopted (serial no. 75-6-6)

1983 The first NSB Comprehensive Plan was adopted by the North Slope Borough Assembly


1998 Dalton Highway Master Plan

2004 Northwest Alaska Transportation Plan

2008 Northwest Alaska Area Plan

2010 Dalton Highway Scenic Byway Corridor Partnership Plan (CCP)

2012 NSB Repair & Replacement Schedule

2013 Barrow Airport Master Plan Update

2013 Adoption of village comprehensive plans (ongoing)

2014 NSB authorizes the creation of the NSB Port Authority (ordinance #2014-01)

2016 NSB Airport Capital Improvement Project Plan

2017 NSB Port Study, currently underway

2018 Update to the 2004 Northwest Alaska Transportation Plan, currently underway

2018 Arctic Strategic Transportation and Resources project begins

2019 Central Yukon Resource Management Plan and Environmental Impact Statement update, currently underway \(^{186}\)

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\(^{186}\) The Central Yukon RMP and EIS will replace the two existing BLM land use plans: the Utility Corridor RMP (1991) and the Central Yukon RMP (1986).
Although many efforts have been made to consider transportation issues on the North Slope, most have not explored a need that is more and more frequently mentioned in local planning efforts – that of inter-village connectivity and seasonal or permanent connection to the state highway system. As development edges closer to North Slope communities, there is an opportunity to further address this need in a way that balances subsistence access and community economic development along the same routes that are shared with natural resource exploration and development. Snow trails and ice roads along with extensions of the gravel infrastructure should be considered as part of the transportation landscape. Improvements to airport infrastructure, trail marking, and alternative uses of DEW Line sites and other developed areas to address spill response, offshore development support, and other issues associated with increased vessel traffic in the Arctic are also very important to the residents.

Distances between North Slope communities are great. The closest communities are Utqiaġvik and Atqasuk (58 miles), while the greatest distance between any two communities, Kaktovik and Point Hope, is 588 miles. The following table delineates distance between communities.

Table 21: Distance between North Slope Communities

<table>
<thead>
<tr>
<th></th>
<th>Anaktuvuk Pass</th>
<th>Atqasuk</th>
<th>Nuiqsut</th>
<th>Kaktovik</th>
<th>Point Hope</th>
<th>Point Lay</th>
<th>Utqiaġvik</th>
<th>Wainwright</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>213</td>
<td>143</td>
<td>247</td>
<td>390</td>
<td>305</td>
<td>248</td>
<td>268</td>
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<td>Atqasuk</td>
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<td>58</td>
<td>65</td>
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</tr>
<tr>
<td>Nuiqsut</td>
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<td>175</td>
<td>414</td>
<td>293</td>
<td>154</td>
<td>215</td>
<td></td>
</tr>
<tr>
<td>Kaktovik</td>
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<td>328</td>
<td>175</td>
<td>588</td>
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<td>316</td>
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<td>269</td>
<td>414</td>
<td>588</td>
<td>135</td>
<td>315</td>
<td>229</td>
<td></td>
</tr>
<tr>
<td>Point Lay</td>
<td>305</td>
<td>145</td>
<td>293</td>
<td>468</td>
<td>135</td>
<td>182</td>
<td>93</td>
<td></td>
</tr>
<tr>
<td>Utqiaġvik</td>
<td>248</td>
<td>58</td>
<td>154</td>
<td>316</td>
<td>315</td>
<td>182</td>
<td>87</td>
<td></td>
</tr>
<tr>
<td>Wainwright</td>
<td>268</td>
<td>65</td>
<td>215</td>
<td>390</td>
<td>229</td>
<td>93</td>
<td>87</td>
<td></td>
</tr>
</tbody>
</table>
REGULATORY

The State of Alaska authorizes home-rule boroughs to provide transportation systems as determined by that borough’s charter or ordinance; NSBMC Title 12: Transportation provides guidance on review procedures for transportation projects, although transportation-related ordinances are found throughout the municipal code. Specifically, NSBMC §12.05.060 calls for a NSB comprehensive transportation plan. §12.05.010 of the North Slope Borough Municipal Code establishes review procedures to ensure “the maximum feasible coordination and consistency between the borough’s transportation plans and improvements and those of other governmental units authorized to carry out transportation needs of the citizens of the borough in as timely and efficient a manner as possible.”

The NSBMC requires Planning Commission review for all major transportation projects constructed or funded in the borough by the State of Alaska or federal government. The review criteria includes consideration as to whether a proposed project is included in the borough Capital Improvement Plan or meets a borough transportation need identified in the Comprehensive Plan or other relevant plans, ordinances, or policies. If a transportation project is not included in the Capital Improvement Plan or identified in other plans, ordinances, or policies, the proposed project must not worsen an existing transportation deficiency or create the need for new transportation facilities not currently planned by the borough.

The NSBMC has two primary ordinances that regulate land use: Title 18 and Title 19. Title 18 regulates subdivision development, such as standards for lot creation and modification, utilities, drainage, and vehicular egress and ingress. Title 19 regulates the creation and division of land into specific zones that permit or prohibit land uses to ensure consistency throughout an area.

Title 18: Subdivisions provides policies and standards relating to road development, including street naming, width, grade, and intersection standards. There are also transportation references contained in Title 19 Zoning. The zoning regulations include parking provisions, consolidation of transportation facilities, minimizing disturbances to the environment. It further states that public highway development is prohibited except for village roads and streets and highways indicated in the state and/or local capital improvement program or any transportation element of the comprehensive plan. Policies pertaining to acceptable uses and development within Transportation Corridors are found in in §19.70.060.

SURFACE TRANSPORTATION

No permanent roads connect the villages of the North Slope to the Alaska road network. A single transportation corridor in the North Slope links Deadhorse, the central unincorporated area that provides services to the surrounding Prudhoe Bay

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oil fields, to the rest of Alaska. The region’s transportation network is shown in Map 10.

**Dalton Highway Transportation Corridor**

The North Slope has only one zoned and permanent transportation corridor – the Dalton Highway Transportation Corridor. A transportation corridor is generally a linear area with one or more modes of transportation, like highways, railroads or public transit, which share a common course. The James B. Dalton Highway is named for a life-long Alaskan and expert in arctic engineering who was involved in early oil exploration efforts on the North Slope. The Dalton Highway, also known as the Haul Road, provides land for linear transportation facilities – namely roads, pipelines, and pipeline maintenance facilities.

The Dalton Highway is a narrow, mostly gravel road with steep grades that undergoes constant maintenance and upgrading by the Alaska Department of Transportation and Public Facilities (DOT&PF). The highway is under constant threat of flooding, avalanches, and failing embankments. It requires constant maintenance that includes road realignment to meet current design standards, bridge replacements, guardrail replacements, improved drainage, and new and replacement culverts. There are lengthy stretches of gravel surface with sharp rocks, potholes, washboard, and, depending on the weather, clouds of dust or slick mud. Snow and ice can be found any month of the year. Heavy rains have periodically wash out culverts, bridges, and large sections of the roadway.

The Dalton Highway is the only road link connecting the North Slope region to the main
Alaska Highway System. It is designated a rural principal arterial and provides the only vehicle access from Fairbanks to Deadhorse, serving as a critical transportation supply route between commerce and industrial centers.\(^{189}\)

It is 415 miles from its beginning north of Fairbanks near Livengood, at its junction with the Elliott Highway at milepost (MP) 73 to its terminus in Deadhorse. The highway was originally built to support construction of the Trans-Alaska Pipeline System (TAPS) by the Alyeska Pipeline Service Company (APSC). Because the road served as a supply route for the construction, operation, and maintenance for the northern portion of TAPS, it was originally closed to the public. APSC maintained the road from its construction in 1974 until 1978, when after Alaska Governor Jay Hammond and NSB Mayor Eben Hopson, Sr., signed a Memorandum of Understanding directing how the Dalton Highway Corridor would be managed. At that time, DOT&PF took over maintenance and operation of the highway. In 1981, DOT&PF opened part of the Dalton Highway – from Fairbanks to Disaster Creek, which is approximately 36 miles north of Coldfoot and 294 miles north of Fairbanks.\(^{190}\) In 1994, the entire Dalton Highway was reclassified as a state highway and became eligible for federal highway funds. It is now open to the public as far as the airport in Deadhorse.

Because the Dalton Highway was not originally intended for public use, many services that travelers would typically expect, such as gas stations, restaurants, and rest stops, are not available. Traveling north from Fairbanks, the

www.dot.alaska.gov/nreg/dalton18-37/.

\(^{190}\) Dalton Highway Mile Markers. [https://static1.squarespace.com/static/5388cf21e4b0a83ac5f971b1/t/5786ac99d2b8572d0472488b/146844858859/Dalton+Highway+Callout+Markers.pdf](https://static1.squarespace.com/static/5388cf21e4b0a83ac5f971b1/t/5786ac99d2b8572d0472488b/146844858859/Dalton+Highway+Callout+Markers.pdf).
last opportunity for many services along the Dalton Highway is in Coldfoot, a former mining town that touts itself as the “Farthest North Truck Stop in the World.” Coldfoot is approximately 248 miles north of Fairbanks in the southern slopes of the Brooks Range. It offers lodging, gas station, post office, general store, recreational vehicle (RV) park, equipment rental shop, and visitor center. Wiseman, 16 miles north of Coldfoot, offers lodging, public phone, gift shop, and visitor’s center.

The highway meets the NSB boundary at mile 235 near the steep mountains at Atigun Pass. It continues 179 miles to the level coastal plain at Prudhoe Bay. There is one section of paved road (with breaks) within the North Slope Borough: from Milepost 335 (Happy Valley airstrip) to Milepost 362. Additional paving is being considered by DOT&PF.

**Regulations**

Uses and development within the Transportation Corridor may require approvals from the NSB as well as federal and state agencies. NSBMC §19.70.060 outlines specific policies for development within the transportation corridor zoning district. Within this district, nodes for development are permitted for public and commercial facilities and services associated with the increased use of the highway. These nodes include the existing pad areas of the former construction camps at Happy Valley and Chandalar Shelf. There are also existing development nodes at Pump Station 3 (within the NSB) and Yukon Crossing, Prospect, and Coldfoot (outside NSB).

Development within the corridor is intended to minimize the negative impacts of increased access to the borough, accommodate industrial, commercial recreation, and visitor industry development while enhancing economic opportunities for borough residents. Development within the NSB boundaries must comply with the Transportation District policies in Chapter 19.70.060.

**Recreation**

Recreational opportunities along the Dalton Highway include camping, hiking, hunting, gold panning, canoeing and rafting, and fishing. Heavy industrial traffic is joined by an increasing amount of independent and tour group traffic. NSB residents have increasingly expressed concern about the traffic affecting their lives and the region’s natural resources, such as impacts to subsistence activities from increased hunting and fishing, contamination to vegetation from roadway dust, litter, trespassing, public safety, and overuse of the lands within the corridor.

The Alaska Department of Fish & Game regulates hunting and fishing within the Dalton Highway Corridor Management Area - five miles on either side of the highway (Alaska Statute 19.40.210). Within this corridor, hunting is allowed by certified bowhunters only.

This ten mile wide corridor is intended to prevent overhunting of wildlife by limiting the

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192 Ibid


number of hunters using the area. It decreases the likelihood of the TAPS being shot. Salmon fishing is not authorized and lake trout is catch-and-release only.

To protect fragile tundra and wetland vegetation of the North Slope, recreational use of all-terrain vehicles (ATVs) or snowmachines is prohibited by state law within the management area. However, people may access the area at any time by boat, airplane, foot, ski, or dog team, depending on seasonal weather conditions. Federal subsistence management regulations authorize subsistence hunting and trapping by residents living within the Dalton Highway Corridor Management Area and the use of snowmachines for that purpose. However, any user can begin outside the corridor on a snowmachine and then cross the highway corridor to access other hunting areas or villages.

NSB residents are concerned that increased sport hunting may result from Dalton Highway improvements. As recreational hunting increases, ADF&G may elect to adjust future harvest levels, which could negatively impact traditional hunting practices for NSB residents. Similar concerns are voice about an all-season public road that could be constructed to Nuiqsut from the Dalton Highway.

Public Safety
As tourism along the Dalton Highway expands, public safety concerns grow. The NSB is tasked with providing emergency services along the Dalton Highway within the borough boundary. While some of this responsibility is shared with other public and private agencies, the NSB’s proximity and its trained personnel at Deadhorse have resulted in the NSB shouldering much of this responsibility for the northern portion of the highway. As tourism along the Dalton Highway expands, this public safety concern grows.

Scenic Byway
The Dalton Highway was designated a State Scenic Byway in 1998. In 1993, the State of Alaska established a scenic byways program that recognizes Alaska’s most scenic and culturally significant travel corridors. The program is administered by DOT&PF.

A Dalton Highway Scenic Byway Corridor Partnership Plan was completed in 2010. The plan identifies issues along the Dalton Highway, that include a lack of security, especially of pump stations; issues with public safety and availability and response time for emergency response; excessive signage that create a negative effect on the surrounding landscape; potential impacts to natural and cultural environment from an increase in visitors; lack of visitor services, such as restrooms, solid waste disposal, lodging, and gas stations; threats to subsistence hunting should recreational travel increase to the area; and the potential interactions from improved

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road conditions, speeding, and with other travelers and wildlife.¹⁹⁸

**Corridor Management**

The Dalton Highway Corridor needs to be managed jointly in a way that ensures that adequate public safety, wildlife management and subsistence resource protection is addressed as use of the Dalton Highway increases.

The Bureau of Land Management, State of Alaska, and NSB and have developed Dalton Highway Corridor management plans and other documents that have addressed concerns with public safety, services, wildlife management, viewsheds, and the need to comply with requirements of NSB ordinances as well as any applicable state and federal regulations. However, there are ongoing concerns about the management of the Dalton Highway and how future traffic increases could affect the people, the environment, and resources of the North Slope.

When state and federal agencies, the oil industry, and the borough and its communities fail to adhere to the local land use plans, an inefficient transportation system can result.

**Community Roads**

Typical of remote Alaskan communities, the distance and climate tend to keep residents isolated. Potential future transportation systems could broaden and diversify the region’s network and create economic opportunities for North Slope residents. The primary modes of transportation in and between North Slope villages are regional airline flights, passenger vehicles and all-terrain vehicles (ATV)/snowmachines on local roads and trails, and skiffs on rivers, lakes, and the ocean.

The North Slope Borough has a total 544 miles of roads, including 413 miles of industrial roads in the Prudhoe Bay region, but excluding seasonal ice or snow roads.¹⁹⁹ There are a total of 123.6 miles of roads within North Slope Borough villages, as shown in Table 22. Most community roads and aircraft runways are constructed from locally mined material. The roads are generally in fair condition although there are seasonal issues of rutting, washboard surfaces, and potholes. Passenger vehicles and ATVs are used year-round to the extent permitted by local road conditions. Snow machine travel within and between villages is common during the winter. Many communities have expressed the desire for evacuation roads for emergency egress.

Limited winter routes are also used in the North Slope region. There is a winter route between Utqiagvik and Atqasuk that is used to transfer fuel, gravel material, and other materials to Atqasuk using rollagons. Also, during the winter, Nuiqsut residents are able to travel eastward on a 17-mile ice road to the Dalton Highway and beyond via the oilfield Spine Road constructed by ConocoPhillips of Alaska. Nuiqsut is the only North Slope village that is connected by road to the rest of Alaska.

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Table 22: Community Road Miles

<table>
<thead>
<tr>
<th>Village</th>
<th>Miles of Roads</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>7.81</td>
<td>Gravel</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>7.09</td>
<td>Gravel</td>
</tr>
<tr>
<td>Kaktovik</td>
<td>8.44</td>
<td>Gravel</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>8.01</td>
<td>Gravel</td>
</tr>
<tr>
<td>Point Hope</td>
<td>14.41</td>
<td>Mostly gravel</td>
</tr>
<tr>
<td>Point Lay</td>
<td>7.98</td>
<td>Gravel</td>
</tr>
<tr>
<td>Utqiagvik</td>
<td>60.66</td>
<td>Mostly gravel</td>
</tr>
<tr>
<td>Wainwright</td>
<td>9.22</td>
<td>Gravel</td>
</tr>
</tbody>
</table>

Industry Roads

In March 2014, the U.S. Army Corps of Engineers approved permits for a 5.8-mile road connecting the community of Nuiqsut to the CD-5 Access Road. The Kuukpik Corporation constructed the road, which begins at the Nuiqsut landfill access road. The Kuukpik Corporation owns and maintains this 24-foot wide road and the 10-acre gravel pad located at the junction with the CD-5 road. The road has several purposes. It provides Nuiqsut residents’ access to the Alpine Development Project for training and job opportunities, and subsistence areas. It improves health and safety by providing a secondary connection between the Nuiqsut and Alpine airports in the event someone requires immediate evacuation. The road provides permanent Nuiqsut residents access to the spur road, which connects the community to ConocoPhillips’ gravel oil field service roads leading to Alpine and some of its satellites in the Colville River Delta and in NPR-A, and to winter ice roads that connect to the Spine Road.

Trails

Trails are essential for travel between North Slope communities and to subsistence harvesting areas within the borough.

There is a need to formally establish the trail system as something more than a project specific use facility and develop the necessary agreements and protocols with the regulatory agencies and industrial users that also allow for local community uses. Conceivably, where necessary, shared use facilities may be used that benefit both local and industrial development activities in the area.

17(b) Easements

An elaborate system of 17b trails provides ATV and snow machine routes used for recreation and subsistence hunting. Many trails within the North Slope and throughout Alaska are 17(b) easements. They are 60-footwide roads, 25- and 50-foot trails, and one-acre sites for short-term use. Easement access provided by BLM when it conveyed land to a Native corporation under ANCSA. The easements are across private land and allow the public to cross private property to reach public lands and major waterways. Neither do 17(b) easements allow the public to use...
adjacent private lands nor hunting, fishing, or trapping within or near the easement without a permit from the landowner.  

Community Winter Access Trails  
The North Slope Borough, in an effort to provide relief to the high cost of living in the region, built approximately 300 miles of snow roads during the winter of 2018 for resident access to the Alaska road system at the Dalton Highway. The benefits of the project are safer travel, reduced cost of search and rescue missions, consolidated travel routes that reduce the impact to the landscape of multiple and uncoordinated trails and routes, lower costs by bypassing barge and aviation transport of goods, and coordination of freight haul.

This new NSB project focuses on resident use of existing snow trails to connect residents of the communities of Utqiagvik, Atqasuk, Wainwright, Nuiqsut, and Anaktuvuk Pass to the state road system by use of improved snow trails. The Community Winter Access Trails (CWAT) permit caravans of 10 to 12 vehicles travel to and from North Slope communities to the Dalton Highway. The first year of the project was the winter of 2018, which connected Utqiagvik to Deadhorse, Utqiagvik with Atqasuk, and the Dalton Highway (near Galbraith Lake) to Anaktuvuk Pass. The permit issued by DNR is for a five year period, through the winter of 2022-23.

Specifically, the NSB CWAT project seeks to: 
- Provide safe, orderly and equitable overland access to NSB communities to reduce the disproportionate and
extraordinarily high cost of air transportation.

- Establish an alternative to air freight and seasonal barge hauling to satisfy community supply needs, including building materials and other supplies.

- Establish the viability of seasonal overland transportation access for predominantly Alaska Native communities that are geographically isolated by federal and state land ownership.

- Support local and regional community economic development opportunities in Alaska Native communities including personal vehicle use and freight hauling.

- Identify preferred routing for a permanent transportation corridor and potential material sites for construction.207

The program incorporates wildlife interaction guidelines as part of the public information campaign and training. Polar bear sightings are collected from all travelers.

AIR TRANSPORTATION

Because there are no year round roads to North Slope communities, residents are highly dependent on air travel to reach destinations within the borough, the rest of Alaska, and beyond.

There are ten public airports in the North Slope Borough, providing air transportation service to each of the eight North Slope communities, the Deadhorse/Prudhoe Bay region, and Umiat.

The two major airports within the North Slope Borough are in Utqiaġvik and Deadhorse: Wiley Post-Will Rogers Memorial Airport and Deadhorse Airport, respectively. These two airports have terminals and more extensive aviation facilities than other public airports in the North Slope. The regional airport in Utqiaġvik, owned by the State of Alaska, offers regularly scheduled direct and non-direct flights to Deadhorse, Atqasuk, Point Lay, Wainwright, Nuiqsut, Anchorage, and Fairbanks. There are also non-direct flights from Utqiaġvik to Point Hope offered twice a week. They usually stop in Point Lay. Point Hope can also be reached from Utqiaġvik via Anchorage or Fairbanks through Kotzebue. Kaktovik can be reached directly from Deadhorse, Atqasuk, Point Lay, Wainwright, Nuiqsut, Anchorage, and Fairbanks. There are also non-direct flights from Utqiaġvik to Point Hope offered twice a week. They usually stop in Point Lay. Point Hope can also be reached from Utqiaġvik via Anchorage or Fairbanks through Kotzebue. Kaktovik can be reached directly from Deadhorse. There is not direct travel between Utqiaġvik and Anaktuvuk Pass. Any travel to this community requires a stop in Fairbanks. The Deadhorse Airport, also owned by the State of Alaska, primarily supports oil field operations, but also provides passenger service connections to the communities of Kaktovik, Nuiqsut, and Utqiaġvik.

The State of Alaska owns the village airports at Deadhorse, Utqiaġvik, and Point Hope. The U.S. Air Force (USAF) owns the runways at Point Lay and the NARL site near Point Barrow (abandoned). In Point Lay, the USAF leases access to the NSB, which operates and maintains the runway. The NSB owns the airports at Anaktuvuk Pass, Atqasuk, Nuiqsut, Kaktovik, and Wainwright. All the airports and landing strips are shown in Map 11. Table 23 summarizes community airport ownership and maintenance responsibilities.

<table>
<thead>
<tr>
<th>Community</th>
<th>Ownership</th>
<th>Maintenance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>NSB</td>
<td>NSB</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>NSB</td>
<td>NSB</td>
</tr>
<tr>
<td>Deadhorse</td>
<td>SOA</td>
<td>SOA</td>
</tr>
<tr>
<td>Kaktovik</td>
<td>NSB</td>
<td>NSB</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>NSB</td>
<td>NSB</td>
</tr>
<tr>
<td>Point Hope</td>
<td>SOA</td>
<td>SOA</td>
</tr>
<tr>
<td>Point Lay</td>
<td>USAF</td>
<td>NSB</td>
</tr>
<tr>
<td>Utqiaġvik</td>
<td>SOA</td>
<td>SOA</td>
</tr>
<tr>
<td>Wainwright</td>
<td>NSB</td>
<td>NSB</td>
</tr>
</tbody>
</table>

Industry airstrips at Kuparuk, Alpine, Badami, and other locations are used regularly for oil industry activity. Airstrips at Franklin Bluff, Happy Valley, and Kavik Camp and others support recreation guide activity. Fourteen unrestricted landing strips are owned primarily by the State of Alaska and BLM. There are an additional 19 restricted landing strips that are either owned privately or by the federal government, state, or borough. Restricted and unrestricted airports and airstrips are provided in tables 24 and 25.

Table 24: Unrestricted Landing Strips in the North Slope Borough

<table>
<thead>
<tr>
<th>Airport/Runway</th>
<th>Surface</th>
<th>Length (ft.)</th>
<th>Owner</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>Gravel</td>
<td>4,760</td>
<td>NSB</td>
<td>Village airstrip - attended</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>Gravel</td>
<td>4,370</td>
<td>NSB</td>
<td>Village airstrip - unattended</td>
</tr>
<tr>
<td>Barrow</td>
<td>Paved</td>
<td>7,100</td>
<td>State of Alaska</td>
<td>Village airstrip - attended</td>
</tr>
<tr>
<td>Barter Island</td>
<td>Gravel</td>
<td>4,818</td>
<td>USAF</td>
<td>Kaktovik Village airstrip - attended</td>
</tr>
<tr>
<td>Chandalar Shelf</td>
<td>Gravel</td>
<td>2,529</td>
<td>State of Alaska</td>
<td>Also called Dietrich Camp</td>
</tr>
<tr>
<td>Deadhorse</td>
<td>Paved</td>
<td>6,500</td>
<td>State of Alaska</td>
<td>Serves Prudhoe Bay oilfield</td>
</tr>
<tr>
<td>Echooka</td>
<td>Gravel</td>
<td>5000 est.</td>
<td>State of Alaska</td>
<td>Unattended</td>
</tr>
<tr>
<td>Franklin Bluff</td>
<td>Gravel</td>
<td>5000 est.</td>
<td>State of Alaska</td>
<td>Unattended</td>
</tr>
<tr>
<td>Galbraith Lake</td>
<td>Gravel</td>
<td>5,182</td>
<td>State of Alaska</td>
<td>Unattended</td>
</tr>
<tr>
<td>Happy Valley</td>
<td>Gravel</td>
<td>4800 est.</td>
<td>State of Alaska</td>
<td>Unattended; seasonal recreational use</td>
</tr>
<tr>
<td>Kaktovik (new)</td>
<td>Gravel</td>
<td>4,500</td>
<td>NSB</td>
<td>Village airstrip - unattended</td>
</tr>
<tr>
<td>Kavi River Camp</td>
<td>Gravel</td>
<td>4700 est.</td>
<td>State of Alaska</td>
<td>Attended, fuel</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>Gravel</td>
<td>4,589</td>
<td>State of Alaska</td>
<td>Village airstrip - unattended</td>
</tr>
<tr>
<td>Peard Bay</td>
<td>Gravel</td>
<td>2000 est.</td>
<td>BLM</td>
<td>Unattended</td>
</tr>
<tr>
<td>Point Hope</td>
<td>Paved</td>
<td>3,992</td>
<td>State of Alaska</td>
<td>Village airstrip - unattended</td>
</tr>
<tr>
<td>Point Lay</td>
<td>Gravel</td>
<td>4,500</td>
<td>USAF</td>
<td>Village airstrip - unattended</td>
</tr>
<tr>
<td>Sagwon</td>
<td>Gravel</td>
<td>2000 est.</td>
<td>BLM</td>
<td>Unattended</td>
</tr>
<tr>
<td>Square Lake</td>
<td>Gravel</td>
<td>2100 est.</td>
<td>BLM</td>
<td>Unattended</td>
</tr>
<tr>
<td>Umiat</td>
<td>Gravel</td>
<td>5,583</td>
<td>State of Alaska</td>
<td>Unattended; used by Linc Energy</td>
</tr>
<tr>
<td>Wainwright</td>
<td>Gravel</td>
<td>4,494</td>
<td>NSB</td>
<td>Village airstrip - unattended</td>
</tr>
</tbody>
</table>

Other airstrips may have been added or are seasonal based on exploration activity.
Table 25: Restricted Landing Strips in the North Slope Borough

<table>
<thead>
<tr>
<th>Airport/Runway</th>
<th>Surface</th>
<th>Length (ft.)</th>
<th>Owner</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alpine</td>
<td>Gravel</td>
<td>5,000</td>
<td>ConocoPhillips</td>
<td>Private oilfield airstrip</td>
</tr>
<tr>
<td>Alpine CD-3</td>
<td>Gravel</td>
<td>3,500</td>
<td>ConocoPhillips</td>
<td>Private oilfield airstrip</td>
</tr>
<tr>
<td>Badami</td>
<td>Gravel</td>
<td>5,100</td>
<td>Savant Alaska</td>
<td>Private oilfield airstrip</td>
</tr>
<tr>
<td>Bullen Point</td>
<td>Gravel</td>
<td>3,500</td>
<td>USAF</td>
<td>Unattended; closed to public</td>
</tr>
<tr>
<td>Cape Lisburne</td>
<td>Gravel</td>
<td>4,805</td>
<td>USAF</td>
<td>Closed to public</td>
</tr>
<tr>
<td>Cape Sabine</td>
<td>Gravel</td>
<td>2,700</td>
<td>BLM</td>
<td>Former DEW Line Station; abandoned</td>
</tr>
<tr>
<td>Cape Simpson</td>
<td>Gravel</td>
<td>2,500</td>
<td>NSB</td>
<td>Former DEW Line Station; abandoned</td>
</tr>
<tr>
<td>Helmericks</td>
<td>Earth</td>
<td>2,500</td>
<td>Private</td>
<td>Unattended</td>
</tr>
<tr>
<td>Icy Cape</td>
<td>Gravel</td>
<td>3,200</td>
<td>USAF</td>
<td>Unattended; closed to public; abandoned</td>
</tr>
<tr>
<td>Inigok</td>
<td>Gravel</td>
<td>5,000</td>
<td>Private</td>
<td>Unattended; closed to public</td>
</tr>
<tr>
<td>Ivotuk</td>
<td>Gravel</td>
<td>5,200</td>
<td>BLM</td>
<td>Unattended</td>
</tr>
<tr>
<td>Kogru</td>
<td>Gravel</td>
<td>1,650 est.</td>
<td>BLM</td>
<td>Former DEW Line Station; abandoned</td>
</tr>
<tr>
<td>Kuparuk</td>
<td>Paved</td>
<td>6,551</td>
<td>ConocoPhillips</td>
<td>Private oilfield airstrip</td>
</tr>
<tr>
<td>Lonely</td>
<td>Gravel</td>
<td>5,000</td>
<td>USAF</td>
<td>Unattended; closed to public</td>
</tr>
<tr>
<td>Oliktok</td>
<td>Gravel</td>
<td>4,000</td>
<td>USAF</td>
<td>Active radar station</td>
</tr>
<tr>
<td>Point Thomson</td>
<td>Gravel</td>
<td>5,600</td>
<td>Exxon Mobil</td>
<td>Private oilfield airstrip</td>
</tr>
<tr>
<td>Tunalik</td>
<td>Gravel</td>
<td>5,200</td>
<td>BLM</td>
<td>Unattended</td>
</tr>
<tr>
<td>Wainwright-AS</td>
<td>Gravel</td>
<td>3,000</td>
<td>USAF</td>
<td>Closed to public in 2007</td>
</tr>
</tbody>
</table>

Other airstrips may have been added or are seasonal based on exploration activity.
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NORTH SLOPE BOROUGH
ARGUSIKI COMPREHENSIVE PLAN 2013 — 2039

### Anaktuvuk Pass
- **Ownership:** NSB
- **Surface:** Gravel
- **Runway Dimensions:** 300'x1500'
- **Runway Visual/Instrument Navaids:** PAPI, ILS, Beacon
- **Runway/Taxiway Lighting:** HIRL
- **NDB:** Yes
- **AWOS/ASOS:** Yes
- **Funded Projects:** None Identified
- **Desired Projects:** No Projects Identified
- **Sources:** 2014 ALP

### Nulivut
- **Ownership:** NSB
- **Runway Dimensions:** 100'x4800'
- **Surface:** Gravel
- **Runway Visual/Instrument Navaids:** PAPI, REILs, Beacon
- **Runway/Taxiway Lighting:** MIRL/MITL
- **NDB:** Yes
- **AWOS/ASOS:** Yes
- **Funded Projects:** None Identified
- **Desired Projects:** No Projects Identified
- **Sources:** 2002 ALP

### Kaktovik
- **Ownership:** NSB
- **Runway Dimensions:** 100'x4589'
- **Surface:** Gravel
- **Runway Visual/Instrument Navaids:** VASI, PAPI, REILS, MALSF, Beacon, GPS
- **Runway/Taxiway Lighting:** HIRL/HITL
- **NDB:** Yes
- **AWOS/ASOS:** Yes
- **Funded Projects:** None Identified
- **Desired Projects:** No Projects Identified
- **Sources:** 2012 ALP

### Deadhorse
- **Ownership:** ADOT & PF
- **Runway Dimensions:** 150'x6500'
- **Surface:** Paved
- **Runway Visual/Instrument Navaids:** VASI, PAPI, REILS, MALSR, Beacon, GPS, ILS, LOC/DME
- **Runway/Taxiway Lighting:** HIRL
- **NDB:** Yes
- **AWOS/ASOS:** Yes
- **Funded Projects:** None Identified
- **Desired Projects:** No Projects Identified
- **Sources:** 2015 ALP

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**Borough Boundaries**
**Restricted Airstrip**
**Unrestricted Airstrip**

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Village airport facilities are basic, generally containing only a snow removal equipment building and a single runway. The airports in Utqiagvik, Deadhorse, and Point Hope have paved runways while the remaining airports all have gravel runways. Approach lighting is installed at all airports. There are no control towers at any airports within the North Slope Borough. Despite the long and cold winter season, only Utqiagvik, Nuiqsut, and Prudhoe Bay have terminals available. All of the other North Slope communities have requested facilities to provide shelter from the extreme weather that also offer restroom facilities.

In 2016, the NSB prepared an Airport Capital Improvement Project Plan that includes detailed current and anticipated needs for NSB airports over a twenty year period.

**Air Carriers**

Alaska Airlines is the only major air carrier that provides regular service to the North Slope. Alaska Airlines has direct flights from Fairbanks and Anchorage to Deadhorse and Utqiagvik. Smaller carriers that offer regular service to North Slope communities include Ravn Alaska, serving Utqiagvik, Deadhorse, Kaktovik, Nuiqsut, Point Lay, Atqasuk, Wainwright, and Point Hope; Bering Air provides service to Point Hope via Kotzebue; and Wright Air offers air service to Anaktuvuk Pass from Fairbanks.

Due to the limited number of air carriers providing service to the North Slope, the cost of both passenger tickets and cargo is expensive. Passenger tickets from Anchorage to Utqiagvik cost about $344 roundtrip. Flights to the villages are also costly. For example, it costs approximately $590 to fly roundtrip from Utqiagvik to Point Lay. The remote location of the North Slope is not the only factor limiting the number of air carriers. A lack of terminal space in both Utqiagvik and Deadhorse keep competition from entering the North Slope market and competing with the established air carriers.

**Table 26: Airlines Serving the North Slope**

<table>
<thead>
<tr>
<th>Airline</th>
<th>Communities Served</th>
<th>City(ies) of Origin</th>
<th>Frequency of Flights/day</th>
<th>Frequency of Flights/week</th>
<th>Additional Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska Airlines</td>
<td>Deadhorse</td>
<td>Fairbanks, Anchorage</td>
<td>3 – 4</td>
<td>Sun - Sat</td>
<td>North Slope hub</td>
</tr>
<tr>
<td></td>
<td>Utqiagvik</td>
<td>Fairbanks, Anchorage</td>
<td>3 – 4</td>
<td>Sun - Sat</td>
<td>North Slope hub</td>
</tr>
<tr>
<td>Ravn Alaska</td>
<td>Deadhorse</td>
<td>Fairbanks, Anchorage</td>
<td>2</td>
<td>M - F</td>
<td>North Slope hub</td>
</tr>
<tr>
<td></td>
<td>Utqiagvik</td>
<td>Fairbanks, Anchorage</td>
<td>2</td>
<td>M - F</td>
<td>North Slope hub</td>
</tr>
<tr>
<td></td>
<td>Kaktovik</td>
<td>Fairbanks</td>
<td>2</td>
<td>M - F</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Nuiqsut</td>
<td>Utqiagvik, Deadhorse</td>
<td>2</td>
<td>Sun - Sat</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Point Lay</td>
<td>Utqiagvik</td>
<td>1 – 2</td>
<td>5 per week</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Atqasuk</td>
<td>Utqiagvik</td>
<td>1 – 3</td>
<td>Sun - Sat</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wainwright</td>
<td>Utqiagvik</td>
<td>1 – 3</td>
<td>Sun - Sat</td>
<td></td>
</tr>
</tbody>
</table>
### Table 27: Airfare and Air Freight Costs

<table>
<thead>
<tr>
<th>Airline</th>
<th>Communities Served</th>
<th>City(ies) of Origin</th>
<th>Average cost</th>
<th>Freight Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alaska Airlines</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deadhorse</td>
<td>Fairbanks</td>
<td>ANC – SCC RT $804</td>
<td>$50 minimum change</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>FAI – SCC RT $663</td>
<td>$0.55 per lb.</td>
<td></td>
</tr>
<tr>
<td>Utqiaġvik</td>
<td>Fairbanks</td>
<td>FAI – BRW RT $325</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ANC – BRW RT $355</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ravn Alaska</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deadhorse</td>
<td>Fairbanks</td>
<td>FAI – SCC RT $568</td>
<td>0 – 32 lbs. / $31 flat rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ANC – SCC RT $680</td>
<td>32+ lbs. / $0.89 per lb.</td>
<td></td>
</tr>
<tr>
<td>Utqiaġvik</td>
<td>Fairbanks</td>
<td>FAI – BRW RT $290</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>ANC – BRW RT $340</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaktovik</td>
<td>Fairbanks</td>
<td>FAI – BTI RT $568</td>
<td>0 – 5 lbs. / $20 flat rate</td>
<td></td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>Utqiaġvik</td>
<td>BRW – NUI RT $506</td>
<td>6 – 31 lbs. / $31 flat rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>SCC – NUI RT $336</td>
<td>31+ lbs. / $1.53 per lb.</td>
<td></td>
</tr>
<tr>
<td>Point Lay</td>
<td>Utqiaġvik</td>
<td>BRW – PIZ RT $590</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atqasuk</td>
<td>Utqiaġvik</td>
<td>BRW – ATQ RT $336</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wainwright</td>
<td>Utqiaġvik</td>
<td>BRW – AIN RT $336</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Point Hope</td>
<td>Utqiaġvik</td>
<td>BRW – PHO RT $852</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Wright Air</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anaktuvuk Pass</td>
<td>Fairbanks</td>
<td>FAI – AKP RT $380</td>
<td>0 - 2 lbs. / $20 flat rate</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>3 – 10 lbs. / $25 flat rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>11 – 35 lbs. / $35 flat rate</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>35+ lbs. / $0.98 per lb.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Bering Air</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Point Hope</td>
<td>Kotzebue</td>
<td>OTZ – PHO RT $504</td>
<td>0 – 100 lbs. / $1.45 per lb.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>101 - 500 lbs. / $1.40 per lb.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>501 – 1,000 lbs. / $1.35 lb.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Northern Air Cargo</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utqiaġvik</td>
<td>Fairbanks</td>
<td>N/A</td>
<td>$50 minimum charge</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1 – 499 lbs. / $1 per lb.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>500 – 999 lb. / $0.99 per lb.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1,000+ lbs. / $0.96 per lb.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

211 Freight charges could also be determined by dimensions. May also include fuel surcharge and an aviation tax. Freight cost is higher for hazardous materials.
Enplanements for NSB communities have remained steady between 2010 and 2017 with the exception of Kaktovik, which has seen an overall increase, despite a drop in enplanements between 2010 and 2012. The two major NSB airports have also experienced steady enplanements between 2010 and 2017. The number of Deadhorse enplanements are directly related to the size of the Prudhoe Bay oilfield workforce. As the price of oil decreased, activity in the Prudhoe Bay oilfield also decreased. Enplanements have also dropped accordingly. Enplanements are shown in figures 12 and 13.

Figure 12: 2010 - 2017 Enplanements for NSB Villages

Figure 13: 2010 - 2017 Enplanements for Deadhorse and Utqiagvik
To offer a more comprehensive approach to air travel on the North Slope through an integrated system, the North Slope Borough could assume operations of state-run airports. This would allow the NSB to benefit residents through airport land leasing that supports aviation uses, unify leasing standards around fair market rent, and provide services that communities’ desire by making use of North Slope Borough Public Interest Determination (PID) contracting for these services.

**Marine Transportation**

North Slope residents are dependent on marine transportation for shipping goods to the Arctic as well as for subsistence harvesting activities. Marine traffic has increased in recent years due to a relatively ice-free Arctic. Higher air and water temperatures have caused permanent ice cover to diminish to low levels seasonally, and scientists predict this trend will continue. An increase in marine traffic increases the likelihood for oil spills and other contamination. Yet there are currently few resources in the Alaskan Arctic to respond to a spill that could cause serious damage to important marine resources such as bowhead and beluga whales, Pacific walruses, ice seals, and sea birds, such as spectacled eiders.

**Barging**

Cargo barges deliver supplies to Point Hope, Point Lay, Wainwright, Utqiagvik, Prudhoe Bay, and Kaktovik during ice-free months in the summer. Barges leave from Seattle on or about July 1 of each year and carry about 3,000 to 5,000 tons, which is estimated to be 75 percent business goods and 25 percent individual goods. Barges generally offload onto the beach; none of the North Slope communities have a port facility.

Due to undeveloped shore-based infrastructure, unloading the barges can be a risky and time-consuming task. If conditions permit, a line haul barge is put on the beach stern first and secured with lines to heavy pieces of equipment that serve as deadheads. A landing craft is put alongside the line haul, and cargo is swung by crane to the landing craft, where it is unloaded by rubber tired loaders. Although this is the quickest way to unload, sea and wind conditions have to be calm and consistent to unload the barge in this manner, and equipment available to hold the barge on the beach. If the haul barge cannot and the beach, a lightering operation occurs in which the line haul barge anchors approximately one half-mile offshore. The landing craft lays alongside the line haul, and cargo is swung by crane from the line haul to the landing craft. Once the landing craft is loaded, it proceeds to the beach landing site and drops a ramp on the beach. Once secured, rubber tired loaders are used to drive onto the landing craft, pick up containers or flats and carry them onto a beach staging area.

Because of its strategic location at the northernmost point in the United States and its access to the Chukchi and Beaufort Seas, and the Arctic Ocean, Utqiagvik is well positioned to serve as a hub for Arctic multi-modal transportation. Industry, government, and private user groups have publically stated that a

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213 Ibid.

could be beneficial given greater use of the Northwest Passage. The North Slope Borough has recognized that the increased traffic is both an opportunity and a risk for North Slope residents.

The NSB Assembly adopted ordinance 2014-01 for the creation of a port authority in July 2014. North Slope voters approved the formation of the port authority; the election was on October 7, 2014. The purpose of the port authority is to protect subsistence resources and enable residents, Tribal corporations and local businesses to take advantage of new economic opportunities through planning, financing and operating and maintaining facilities and related activities.  

The North Slope Borough has become acutely aware for the need for a safe harbor and staging area, likely in Utqiaġvik. A barge docking facility has been suggested, and a NSB Project Analysis Report was prepared in the early 2000s for a single launch and floating dock along the short channel between Elson Lagoon and North Salt Lagoon. At the time, the rough cost estimated by the NSB Public Works Department was five to eight million dollars. The Port Authority has commissioned a study to determine the feasibility of developing a post. Ukpiaġvik Iñupiat Corporation is also interested in developing a port in Utqiaġvik and has conducted an internal study to determine both the cost and most viable location for a port.

**U.S. Coast Guard**

The United States Coast Guard’s (USCG) Arctic Strategic Plan, published in 2013, describes the anticipated presence of the USCG in the Arctic in upcoming years. Shipping between two destinations outside of the Arctic is increasing dramatically. One million tons of marine cargo transited through an Arctic route in 2012. The USCG expects maritime activity in the Arctic to continue to evolve from exploration and scientific research to resource extraction and commercial shipping. In the short time between 2008 and 2012, traffic moving through the Bering Strait increased 118 percent. According to the USCG Arctic Strategic Plan, “An oceanic trade route across the Arctic from the North Atlantic to the North Pacific would represent a transformational shift in maritime trade, akin to the opening of the Panama Canal in the early 20th century.” As a result of the increased traffic in this area, the USCG prepared Preliminary Findings - Port Access Route Study (PARS): In the Chukchi Sea, Bering Strait, and Bering Sea, completed in 2016. The PARS evaluated the need for creating new vessel routing measures, with a goal to reduce the risk of marine causalities and their impact on the environment as well as increase the efficiency and predictability of vessel traffic while preserving the right of navigation. The PARS recommends that since the Bering Strait is recognized as an international strait, and is already used by vessels from many different nations.

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215 North Slope Borough. 2014. _North Slope Borough Ordinance Serial No. 2014-01: An Ordinance for the Creation of the North Slope Borough Port Authority under the Municipal Port Authority Act Statute §29.35.600-29.35.730._


219 Resource extraction is not an immediate concern due to Shell pulling out of Chukchi Sea resource exploration and extraction in 2015.


nations, routing measures should be pursued through the International Maritime Organization. The seven PARS identified alternatives that focus on transit routes through the Bering Strait and areas to be avoided. The study area did not address the North Slope coastline. The USCG is undertaking another Port Access Route Study for the Arctic Ocean coast in Alaska. The study is anticipated to be completed within the next two years.

Increased cooperation among the agencies that manage lands across the North Slope is needed to ensure that vessel traffic is realistically monitored, oil spill contingency preparedness, international travelers security issues are addressed, and existing disturbed sites like the old DEW Line sites and other coastal installations are available to support the USCG mission.

Marine Subsistence

The ocean and rivers on the North Slope provide transportation for many subsistence activities. Iñupiat people living in coastal villages have hunted bowhead whale for thousands of years. As the International Whaling Commission acknowledged, "whaling, more than any activity, fundamentally underlies the total way of life of these communities." Skin boats (umiat) are commonly used in spring whaling. Conventional boats are used during fall whaling, as well as for other subsistence pursuits, such as caribou, seal, or walrus hunting, and fishing the rivers with Chukchi and Beaufort seas access. Many North Slope communities have sought to build or improved boat ramps and related infrastructure to more easily access ocean resources.

ARCTIC STRATEGIC TRANSPORTATION AND RESOURCES

Over the past several decades, communities located in the North Slope region of Alaska have largely been limited to seasonal access for trade and commerce. Seasonal ice roads have provided a major conduit for goods and services in addition to rollagons on trails to reach and supply communities not linked to the seasonal road system. During ice-free portions of the year, most goods including food and fuel are flown into communities. Recently, the season for constructing ice roads has become shorter, reducing the time when communities can be reached through surface-based freight forwarding techniques. Marine shipping is increasing with the diminishing sea ice and portal nodes are becoming an integral part of regionwide connectivity. Communities in the North Slope region have recognized that if their communities are to continue to grow and families remain intact, it is important that an all-season transportation system be identified and the gaps in technical information required to support construction of the required infrastructure be cataloged. Using a Cumulative Benefits approach across the north slope landscape to identify options for an all-weather transportation network, provides a useful mechanism for maximizing opportunities for communities, the state, and resource development entities to implement the Arctic Strategic Transportation and Resources vision.

The ASTAR project has several long term goals. A strategic planning document of the North

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Slope region will be developed that uses a cumulative benefit analysis process to identify strategic opportunities for infrastructure development to connect communities and enhance resource development. The project will also identify and analyze arctic resources to foster a responsible, efficient, and benefits-based development vision. ASTAR will also act as a central repository of needs and resource information to help guide developers in selecting projects that best serve the people of the region.  

The ASTAR project also includes efforts to share mapping resources, gravel exploration with the Alaska Division of Geological & Geophysical Surveys, and identification of historic trails.

The project officially began in January 2018. The first phase of the project is to gather information through community scoping and data analysis. The project will identify potential infrastructure projects beneficial to the region. This multi-year effort that is still in its infancy. The borough is a leader and key partner in the ASTAR effort. Map 37 illustrates a connectivity vision for North Slope communities.

**TRIBAL TRANSPORTATION PROGRAM**

The federally administered and funded Tribal Transportation Program (TTP) assists in providing for the transportation needs of Tribes through funds for planning, design, construction, and maintenance activities for public roads that provide access to and within Indian reservations, Indian trust land, restricted Indian land, and Alaska Native villages. The Tribal Transportation Program replaces the former Indian Reservation Roads (IRR) Program under the U.S. Department of Transportation (USDOT), Federal Highway Administration Division (FHWA), and Federal Lands Highway Program. The Program has been co-administered by FHWA’s Federal Lands Highway Office and the BIA since 1983.

One of the primary objectives of the program is to contribute to the economic development, self-determination, and employment of Indians and Native Americans. The TTP funds are allocated amongst tribes using a statutory formula based on Tribal population, road mileage, and average tribal shares of the former TTP Allocation Methodology formula. The program received $465 million in fiscal year 2016, with increases of $10 million per year to $505 million in FY 2020, as established in Public Law 114-94, Fixing America’s Surface Transportation Act (the FAST Act).

The Tribal governments for Point Hope, Wainwright, Utqiagvik (Native Village of Barrow), Nuiqsut, and Kaktovik each administer their individual TTP. Point Lay, Atqasuk, and Anaktuvuk Pass have consolidated their program under the guidance of ICAS for efficiency.

With limited funding available to address many transportation needs across the North Slope, it will be increasingly important to coordinate the funding sources with community priorities.

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227 Ibid
HEALTH AND SAFETY

Winter Trail Safety
The increased availability and affordability of handheld Global Positioning System (GPS) units has greatly reduced the number of lost travelers along the North Slope’s winter trails. However, handheld GPS units are not fail-safe. The need for additional preventative measures to prepare travelers as much as possible is still present. These measures often include carrying a personal locator beacon (PLB) and submitting a travel plan to a local search and rescue office, carrying sufficient gear, and knowing the locations of cabins and shelters. One additional measure to help ensure the safety of travelers in the harsh Arctic climate is trail marking.

An earlier effort to mark trails was funded in 2001 by the Department of Natural Resources Snowmobile Trail Advisory Council (SnowTRAC) grant program and provided $15,000 to the North Slope Borough. In 2016, Barrow Search & Rescue kicked off a new trail-marking project funded by the Arctic Slope Community Foundation. Trails between Wainwright, Atqasuk, and Utqiaġvik have been marked with strong stakes inserted in the permafrost along old BLM trails.228 This effort likely does not mark all trails used by residents travelling outside villages. There is an opportunity to work with DOT&PF to make use of available funding to expand the trail marking project across the North Slope.

Dust
NSB residents frequently cite dust as an environmental issue during the summer months, after break-up. Dust from traffic can cause health problems and contaminate subsistence foods. Airborne dust is problematic, causing respiratory problems such as bronchitis, asthma, and a high incidence of sinus infection.229 Roadway and airport dust is also blown onto drying subsistence foods, which can cause them to be inedible. Elders and youth are reportedly the most affected by outdoor dust.

The NSB primarily uses water to suppress dust in all communities. It has attempted to control dust in the villages using a chemical dust retardants that hardens road surfaces but with limited success.

Erosion and Flooding
Communities in the NSB experience flooding and erosion, to varying degrees, that affect their transportation system. Point Hope has a long-standing need for an evacuation road to provide access to higher ground in a flood event. The Naval Arctic Research Laboratory in Utqiaġvik is cut off from the rest of the community during severe storms because the only access road, Stevenson Street, is often unpassable and washed out. However, the construction of an alternative roadway between Utqiaġvik and NARL is underway.

USCOE and NSB are considering installing a revetment in Utqiaġvik to protect the coastline and prevent further erosion. Studies by the U.S Corps of Engineers and NSB examined the


significant beach erosion issue that poses risk to critical public infrastructure.

Many roads in Atqasuk have little or no binding material and during rainy weather have severe erosion problems. Access to both of the communities’ cemeteries is severely limited and the effects of severe storms continue to worsen the road condition.

**Snow Drifting**
Blowing wind can create snow drifts across roadways that impend traffic and create dangerous driving conditions. Snow removal is extremely costly and time-consuming, requiring trucks, loaders, and graders. In some NSB communities the snow fencing is inadequate to prevent snow drifts and needs to be replaced or repaired. Drifting snow can require constant monitoring and maintenance and at times, curtails travel.

**Pedestrian and Vehicular Safety**
Pedestrian safety is an issue that affects the entire North Slope. Residents are much more likely to walk throughout a community when they feel safe.

Pedestrian and vehicular safety measures include ensuring roadway shoulders and rights-of-way are clear of obstructions, such as dumpsters or large utility service barrels that could force residents to walk into the roadway; ample visibility for oncoming traffic so driver can see pedestrians; appropriate number, design, and location of signs; and sufficient lighting for pedestrians. Helmet use for ATV and snowmachine riders is essential.

**CONFLICTS BETWEEN SUBSISTENCE AND TRANSPORTATION**

Inadequately planned transportation infrastructure has the potential to negatively impact the subsistence lifestyle practiced by many residents on the North Slope. As discussed in Chapter 6, North Slope residents rely heavily on subsistence resources for their daily diet. Subsistence activities not only provide meals, they also allow residents to participate in a cultural activity with their family as their ancestors did, and reinforcing the Iñupiaq values.230

NSB residents recognize that new transportation routes have the potential to improve access to subsistence areas and could provide a less expensive, more reliable transportation network. Yet road development, particularly all-season road development, also has many residents concerned. These residents express concern that road connections could bring outsiders to the North Slope that will harvest subsistence resources.

Restrictions on access to public lands leased for oil and gas exploration or development are also a concern. Such restrictions could result in denial of public access to areas traditionally used for subsistence hunting and fishing as well as recreation for residents. Maintaining existing access to subsistence resources is critical to the people of the North Slope.

Bowhead whales are sensitive to noise and shipping traffic (including village barge traffic). This is especially evident during whale migration. In recent years, the Beaufort Sea has remained ice-free for longer periods. Prolonged periods

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230 See Table 2 for a list of the Iñupiaq values
without sea ice will likely result in increased ship traffic through the Northwest Passage, causing increased noise. Vessel noise may affect bowhead behavior, which may result in affects to subsistence activities. AEWC works annually with industry partners to develop a Conflict Avoidance Agreement (CAA). This agreement implements mitigation measures that allow industry to conduct work while maintaining the availability of marine mammals for subsistence hunters. One important aspect of the CAA are time and area closures. Those closures allow whale hunters subsistence hunting activities. After the bowhead quota is filled or a village completes their hunt, industry can resume work.231

Benefits of air transportation include economic opportunities through increased tourism, residential transport of goods, commercial goods transport, but aircraft noise and an increase in hunters can also disrupt wildlife migration and increase competition for wildlife and fish resources. For instance, sport hunters fly to remote areas near Anaktuvuk Pass and set up remote hunting camps north of the pass. They may deflect caribou from moving south through the pass by not understanding the caribou migration routes. There is also the potential for airboats to access rivers from the state highway system. The noise from airboats would likely cause disruption to wildlife.232

CAPITAL FUNDING
The North Slope Borough funds capital project annually. Recently, capital funding allocated for community infrastructure is approximately $60 to $100 million annually. Yet, the amount available to fund transportation network expansion is limited.

The common goals of the many transportation planning efforts are significant and need to be of the ongoing discussion. Developing and sharing an inventory of community priority projects for funding consideration is part of this process.

TRANSPORTATION PLANNING COORDINATION
Transportation decisions on the North Slope often involve numerous government agencies and private entities. For example, gravel, paved, and ice roads to support the oil and gas industry involve potential partnerships between the oil and gas companies, the Alaska DOT&PF headquarters office in Juneau and the regional DOT&PF office in Fairbanks, engineering and environmental consultants to the DOT&PF, the Alaska Department of Natural Resources (DNR), BIA, BLM, village and city officials, and various departments within the NSB. Coordinating on such large and complex projects can be daunting. Lack of coordination and conveying update-to-date information to all entities involved can lead to delays or misunderstandings of the planning and design process as well as poor or ill informed decision-

making. Local governments often feel removed from the process as they struggle to stay informed and keep up with sometimes swiftly changing priorities.

The need for better coordination amongst all stakeholders and levels of government is imperative for project success.

### Table 28: Transportation Plans Goal Comparison

<table>
<thead>
<tr>
<th><strong>2019 - 2039 North Slope Borough Comprehensive Plan</strong></th>
<th><strong>2005 North Slope Borough Long Range Transportation Plan</strong></th>
<th><strong>Northwest Area Transportation Plan Draft Goals</strong></th>
<th><strong>Arctic Strategic Transportation and Resources (ASTAR)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Goal 1</strong>: Cooperate with land owners and managers to update land use regulations consistent with village priorities. <strong>Goal 7</strong>: Provide essential public infrastructure and services.</td>
<td><strong>Goal 1</strong>: Provide basic access to social services.</td>
<td>The goal is to develop a strategic plan that first prioritizes community needs and then looks to identify infrastructure opportunities for the most cumulative benefit and quality of life for the region.</td>
<td></td>
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<tr>
<td><strong>Goal 4</strong>: Improve transportation between North Slope communities. Plan, design, construct and maintain transportation facilities in a manner that preserves the local environment and subsistence lifestyle.</td>
<td><strong>Goal 2</strong>: Improve community connectivity through modernization or preservation of the transportation system. <strong>Goal 2a</strong>: Modernize/enhance the system. <strong>Goal 2b</strong>: Ensure the preservation of the system.</td>
<td>Enhance access to create opportunities to strengthen cultural exchange and community connectivity.</td>
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<tr>
<td>Maintain a diverse transportation system to support mobility.</td>
<td><strong>Goal 3</strong>: Enhance transportation system efficiency. <strong>Goal 3a</strong>: Reduce project costs to design, construct, and maintain. <strong>Goal 3b</strong>: Reduce project delivery delays.</td>
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<tr>
<td></td>
<td><strong>Goal 4</strong>: Support improvements to transportation levels of services.</td>
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<tr>
<td></td>
<td>Support transportation facilities that provide for social and economic growth.</td>
<td><strong>Goal 5</strong>: Enhance system adaptability and flexibility.</td>
<td>Lower the cost of energy, basic goods, utilities, and other services</td>
</tr>
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<td><strong>Goal 6</strong>: Develop strong, resilient local and regional economies. <strong>Goal 6</strong>: Facilitate economic development.</td>
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<tr>
<td><strong>Goal 8</strong>: Partner and collaborate with industry for the benefit of borough residents. Create healthy, safe and efficient transportation.</td>
<td><strong>Goal 7</strong>: Facilitate development of natural resources.</td>
<td>Improve infrastructure to provide community stability and improve public safety</td>
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COMMUNITY INPUT, FINDINGS, NEEDS, AND CHALLENGES

The North Slope region’s remoteness and lack of connectivity to the rest of Alaska affects nearly all aspects of residents’ lives. There is an absence of inter-village connectivity or seasonal or permanent connection to the state highway system. Trails and winter access roads provide links between villages. Yet these access routes do not compensate for the cost of flights to villages or the extremely high cost of shipping goods. As industry exploration and development advances closer to North Slope communities, there is an opportunity to address the lack of connectivity in a way that balances subsistence access and community economic development of the villages. Increasing natural resource development also makes addressing unregulated marine transport more critical. More effective collaboration among local entities and with state and federal agencies is becoming more essential.

Transportation issues and concerns identified by workshop participants are provided in Chapter 2 and listed below:

- Logistics of fuel delivery
- Revenue is not keeping up with cost of capital maintenance or replacement
- A future road system would allow greater infrastructure expansion and investment in villages
- Regional power plant
- Expand Service Area 10
- Port authority bonding potential apart from NSB
- Utilize contamination clean-up to subsidize transportation systems, etc. through cost sharing
- Increased marine traffic
- Limited free market economy
- Limited number of airlines
- Bond expense eligibility / bond rating and capacity; tax vs debt capacity
- Deferred maintenance
- Shortfall of capital funding
- Marine transportation availability is seasonal
- Develop local and/or regional material resources
- Marine transportation and future access to fiber optics
- Road connection would have negative impacts on lifestyle, culture, hunting, control, additional load on infrastructure, housing
- Unregulated marine traffic
- Lack of ports
<table>
<thead>
<tr>
<th>Findings</th>
<th>Needs &amp; Challenges</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distances between North Slope communities are great.</td>
<td>The Dalton Highway Corridor needs to be managed jointly in a way that ensures that adequate public safety, wildlife management and subsistence resource protection is addressed as use of the Dalton Highway increases.</td>
</tr>
<tr>
<td>There are no permanent roads connecting North Slope villages to the rest of Alaska.</td>
<td>Emergency and other services along the Dalton Highway are limited.</td>
</tr>
<tr>
<td>Roads on the North Slope are primarily unpaved.</td>
<td>The borough could establish a stronger partnership with local Tribal governments to tap into additional transportation funding.</td>
</tr>
<tr>
<td>The North Slope has only one zoned and permanent transportation corridor – the Dalton Highway Transportation Corridor.</td>
<td>There are many landowners, land managers, and planning efforts that must be considered when planning transportation infrastructure.</td>
</tr>
<tr>
<td>The primary modes of transportation for residents are regional airline flights, passenger vehicles and ATV/snowmachines on local roads and trails, and skiffs on rivers, lakes, and the ocean.</td>
<td>Village airport facilities are limited. They generally do not provide shelter from the weather or other facilities for passengers.</td>
</tr>
<tr>
<td>Potential future transportation systems could broaden and diversify the region’s network and create economic opportunities for North Slope residents.</td>
<td>The North Slope Borough could assume the responsibility for managing additional state-owned airports on the North Slope.</td>
</tr>
<tr>
<td></td>
<td>The cost of flights and cargo is often cost prohibitive and contributes to the high cost of living in the region.</td>
</tr>
<tr>
<td></td>
<td>Increased marine traffic presents an opportunity to reduce the cost of shipping goods to the North Slope while also brings challenges, such as unregulated traffic and borders, subsistence conflicts, increased likelihood of oil spills, and invasive species.</td>
</tr>
<tr>
<td></td>
<td>Gravel resources are limited and expensive to transport.</td>
</tr>
<tr>
<td></td>
<td>With limited funding available to address many transportation needs, it is increasingly important to coordinate the funding sources with community priorities.</td>
</tr>
</tbody>
</table>
PRIMARY TRANSPORTATION GOAL

Goal Four: Improve the borough’s transportation network between communities.

Objective 1: Focus efforts to improve inter- and intra-community connectivity

4.1.1. Investigate ways to entice additional airlines to serve North Slope villages in an effort to increase competition, choice, efficiency, and cost.

4.1.2. Ensure close involvement in any program to connect villages to the road system, which would allow greater infrastructure expansion and investment in villages but could also negatively affect residents through importation of alcohol and drugs and interrupt subsistence activities and caribou migration routes.

4.1.3. Extend village roads to support community growth and new housing to alleviate overcrowding.

4.1.4. Support community dust control efforts and seek new and innovative methods to suppress excessive dust to further public health.

4.1.5. Improve road and airport maintenance budgeting tools to better track and forecast expenditures.

4.1.6. In Utqiâŋvik, coordinate with ADOT&PF on lease areas and street realignment to improve airport loading and unloading and traffic congestion.

4.1.7. Stake and map trails and provide trail coordinates to travelers for safe navigation.

Objective 2: Coordinate efforts with outside agencies to develop more efficient marine, air and road transportation corridors.

4.2.1. Actively participate in and promote public review and input into the writing, review and approval of any transportation or utility corridors, plans or routes undertaken by the borough, state, or federal government within the NSB.

4.2.2. Develop regulations and guidelines for proper siting, design, construction, and maintenance of transportation facilities so as to not adversely impact subsistence resources.

4.2.3. Continue important efforts to develop a port on the North Slope due to the recent increase in marine traffic, a trend likely to continue well into the future.
4.2.4. Ensure the airport facilities within the borough continue to meet the needs of residents and the local economy through regular needs assessments and usage data.

4.2.5. Reserve land for future transportation needs and activities through easements and land acquisition.

4.2.6. Develop a program to anticipate advances in transportation technology and other innovations.

4.2.7. Establish development nodes along Dalton Highway.

4.2.8. Coordinate with ADOT&PF to potentially manage state operated on the North Slope.

4.2.9. Seek bonding and other funding for port one or more facilities from non-borough entities.

Objective 3: Work with Industry to develop mutually beneficial transit on the slope.

4.3.1. Seek assistance and funding from industry for transportation needs

4.3.2. Seek borough right-of-first refusal on remediated abandoned industry gravel roads.
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CHAPTER 10: ENERGY

Historically, NSB communities provide power through either diesel generated electricity or natural gas generated electricity. Heat is usually provided using heating oil (diesel) fired systems or using natural gas. Gasoline is available in all the North Slope's community and is used for most motorized transportation (automobiles, boat motors, snow machines and ATVs). With the exception of Utqiagvik, light, power, water, sewer, and fuel delivery services in the villages are provided by NSB at highly subsidized rates.

ENERGY

Electrical Power
Electricity is produced using generators housed in power plants within each community. Anaktuvuk Pass, Atqasuk, Kaktovik, Point Hope, Point Lay, and Wainwright produce power using diesel fired generators. Nuiqsut utilizes natural gas for primary power generation with diesel generation as back up, while Utqiagvik utilizes only natural gas for power generation. All power is generated and delivered locally in each community, with no interties between communities.

Heat
With the exception of Utqiagvik and Nuiqsut which use natural gas for home heating, heating oil (diesel) is the primary heating fuel. Heat recovered from power generation facilities is also utilized to some degree. Propane is sometimes used for camping and cooking, but is rarely used for home heating.

In the winter, community water systems need to be heated and kept constantly circulated to keep from freezing. The sewer mains and service lines are also heated with electrical heat trace or glycol circulation loops.

Transportation
Local transportation is generally by passenger vehicle or snowmachine during the winter and passenger vehicle, ATV, or boat during the summer. Gasoline is needed for most vehicles, although there are some diesel vehicles. Except for Nuiqsut, which is connected by roadway in the winter, long distance transportation is by airplane.

ENERGY EFFICIENCIES

According to studies done in the Northwest Arctic, electric energy makes up approximately 30 – 40 percent of annual utilities energy requirement, while heating requirements account for the remaining 60 – 70 percent of the load. In the extreme climate of arctic Alaska, some energy efficiency improvements, such as LED lighting retrofits and controls programming can provide substantial benefit for a minimal amount of input. The greatest energy efficiency gains take more considerable and coordinated effort to achieve.

Infrastructure Upgrades
Energy costs associated with sewer and water utilities account for between 10 - 35 percent of a community’s total energy use. Even when sewer and water systems are considered sufficient for demand, improvements can be made to insure reliability and to reduce energy use. Significant
energy savings can occur through the capture of waste heat, and carefully calibrating the operating system, such as operating pressures and temperatures and pumping flow rates.

Typically, the power plants are configured with load sensing switchgear and multiple generators so electrical demand can be met using the most efficient generator, or combination of generators. Community power plants are routinely analyzed for efficiency improvements, such as matching generator sizing to demand, to increase operating efficiencies and lower operating costs. These types of improvements are considered a normal part of ongoing operation and maintenance.

Weatherization
Weatherization includes upgrades to the building envelope and insulation, domestic hot water, HVAC controls, heating, lighting, motors and pumps and ventilation. Weatherization of just the large public buildings in a community can have a significant impact on overall energy costs, while many improvements, such as lighting controls and upgrades or setting back thermostats, are relatively low cost with great energy saving benefits.

There are several state and federal programs that provide funding for energy audits and/or weatherization, including the Department of Energy Efficiency and Conservation Block Grant (EECBG) program, the Alaska Housing and Finance Corporation (AHFC), the Department of Energy (USDOE), and the Village Energy Efficiency Program (VEEP). These programs have been particularly successful in the interior northern Alaska region, with an average of 43 percent reduction in energy use and a 29 percent reduction in home energy costs in those homes that have been retrofitted through weatherization programs.233, 234

The North Slope Borough’s Public Works Department managed program funds in the North Slope region. The weatherization program ceased operation on June 30, 2018.

Waste Heat Recovery
Heat recovered from community power generation can be used for heating nearby buildings or, when the water infrastructure is near enough to the power plant, waste heat can be used to offset much or all of the fuel oil required to heat the water system. The potential energy savings that can occur through the recovery of waste heat are substantial.

- Recovered waste heat has no cost of production, as it is a byproduct of electrical generation.
- Recovered waste heat has a continuous benefit in arctic regions, as electricity is continually produced, and heat is required almost year round.
- Disposing of waste heat is mandatory and costly. So the costs of alternatives, such as heat recovery, can be offset by the cost of disposal.

234 Household energy savings are computed by using AKWarm, an AHFC-developed building energy modeling software which models expected energy consumption based on a home’s construction, features, appliances, and results from tests conducted on the home by certified energy raters. Since 1997, at least six studies have been undertaken to evaluate the accuracy of AKWarm’s residential energy assessment model and each have concluded that AKWarm produces a statistically accurate estimate of annual home energy.
Heat recovery is currently being utilized in most NSB communities when viable. However, some of these systems have issues that need to be addressed.

**Energy Efficient Technologies**

As the economic and environmental cost of energy production increases, the focus on development of energy saving technologies is also increasing. Although many of the new efficiency technologies do not currently offer cost effective gains in efficiency in environments like remote arctic Alaska, there are some viable options available now. For example:

In 2009, a prototype Sustainable Northern Shelter home, developed by the Cold Climate Housing Research Center in collaboration with Tagiguqmiullu Nunamiullu Housing Authority was constructed in Anaktuvuk Pass. This single family home was developed to maximize indoor environmental quality, energy efficiency, and cost savings in arctic environments, and included the capture of wind and solar photovoltaic energy. Two more prototype homes were constructed in 2010 in Atqasuk, and subsequent generations of these single-family unit designs have been built in Anaktuvuk Pass, Atqasuk, Nuiqsut, Wainwright, Kaktovik, and Point Lay. Monitoring of the prototype home in Anaktuvuk Pass has shown a marked decrease in heating fuel usage to approximately 27 percent of normal community average.

One way to advance energy efficiency is through better tracking of energy use, for example, smart meters can be utilized that teach energy efficiency and awareness through providing feedback on electrical energy usage to the consumer and/or utility provider. Studies have shown that an average of 20 percent can be saved on electric bills with these devises. A smart energy meter placed within households allows each individual to monitor energy usage and predict monthly electric cost. The smart meter can show energy use in real time and also warns when the power cost equalization (PCE) or NSB subsidy limit has been reached (600 kilowatt hour (kWh)), the point at which the cost dramatically increases. The average smart meter user can save 5 – 30 percent.

Smart meters also come with two-way communication capability – allowing the utility to retrieve data remotely, as well as disconnect or limit customers’ electrical consumption for non-payment. Existing smart meter systems are problematic in certain communities, and all are being evaluated so that, ultimately, a common system will be identified that will work for all communities.

**Areawide Potential – Energy Efficiency Upgrades**

**Revitalize Energy Efficiency Upgrade Programs and Funding**

All of the NSB communities have potential for energy efficiency upgrades. One examples is the current areawide upgrades projects for distribution, metering, and lighting. Table 47 in Appendix D outlines energy efficiencies by community.

In general, these upgrade projects tend to be related to NSB infrastructure, and not as targeted toward community housing, although there has been some energy audit and weatherization work. Opportunities for funding energy audit and weatherization projects are many; any energy efficiency improvements will directly impact NSB through a reduction in fuel demand for electricity and heating. Because NSB
provides and subsidizes power and heat to the villages, any reduction in energy usage is a cost savings to NSB. Home weatherization programs provide an average reduction in energy use of 43 percent and less than 10 percent of the homes in the villages have had energy audits or weatherization. There is good incentive to pursue these programs.

The NSB has its own Housing Department that is dedicated to areawide housing. Additionally, the Housing Solutions Group that focused primarily on housing costs and design is being rolled into the newly re-established Housing Department. The NSB should take increased initiative for providing home energy audits and weatherization by pursuing funding and assistance sources. NSB should also analyze which types of homes should be targeted for upgrades as well as the cost effectiveness of providing direct funding to individual homeowners for weatherization, should outside funding not be available or too cumbersome to acquire.

Continue to Pursue Opportunities for Combined Heat and Power Systems
When electrical power is generated, there is always inefficiency and energy is wasted, typically in the form of heat. This wasted heat can be recovered and used in other energy demand, such as temperature control in water circulation systems. Using energy across demands, such as using recovered heat from power generation for heating water, is called Combined Heat and Power (CHP). The cost of implementing CHP systems is generally lower than demand specific energy systems, as the usable by-product, such as heat, has related cost of production.

In many cases, unused energy by-product will create a cost to a demand system. For example, heat generated by power generation must be removed from power plants, or systems will overheat. The cost of removing this heat is typically related to radiators and fans. In many of the NSB villages, power plants are currently experiencing overheating issues and a program for expanding the cooling systems is underway.

In all new projects which produce energy by-product, include the opportunity for recovery and use of the by-product in the design and overall project life-cycle costs. When analyzing the cost benefit of waste heat recovery in existing systems, include costs relating to the alternative disposal of the excess heat if not recovered and used.

Pursue and Utilize Cost Effective Energy Efficient Designs
Historically, design of NSB funded buildings has been capital cost prioritized, with keeping cost per square foot of design and construction low. Although this priority has provided a more budget friendly approach to projects from an invested capital standpoint, it has not been the most cost efficient method of construction from the standpoint of operational costs, such as heating and electric.

Annual energy costs are becoming more and more of the total cost of ownership, and mainstream homebuilders are increasingly incorporating energy-efficient designs as standard features. NSB should require a more comprehensive cost analysis in future building design, with life cycle operational costs integrated with initial capital demand, with the resulting net present value becoming more of a factor when considering design.
**ALTERNATIVE ENERGY**

Currently, NSB communities provide energy through either diesel fuel or natural gas. The NSB Public Works Department distributes heating fuel to the local village corporations at no charge. In turn, the village corporation charges the residential customers the cost for delivery only. Also, NSB subsidizes the cost of fuel for power generation, which runs into millions of dollars per community per year. Offsetting these costs through lower cost energy alternatives is a priority and, there are many sources of alternative energies in the NSB to consider.

**Natural Gas**

Other than the oil and gas production within the Prudhoe Bay fields, only Utqiaġvik produces natural gas for local power generation and household use. Gas developed from the Utqiaġvik gas fields is not currently distributed to any villages, as the cost is prohibitive. Natural gas is also utilized in Nuiqsut for power generation and home use, but this energy is supplied by ConocoPhillips Alaska from its Alpine Oil Development site, via pipeline to the community. This gas is supplied by ConocoPhillips Alaska based on an agreement to compensate for oil exploration in the area.

There are undeveloped known reservoirs of natural gas in the proximity of some of the villages but, to date, no exploration or development has taken place, and no feasibility studies have been made.

Potential energy resources across the North Slope are shown in Map 12 and undeveloped oil and gas resources within the NPR-A are shown Map 13.
North Slope Borough - Known
Undeveloped Oil and Gas Resources
Within NPR-A - Map 13

- Roads
- Borough Boundaries
- National Petroleum Reserve - Alaska
- Gas Accumulation
- Oil Accumulation
- NSB Communities
- Industrial Center

Data Sources:
- Oil and Gas Technical Report: Planning for Oil and Gas Activities in the National Petroleum Reserve-Alaska
Other Natural Gas Fuels

- Propane is readily available in NSB communities and widely used for camp heat and cooking. However, according to a study conducted by the Alaska Center for Energy and Power, converting diesel-fueled systems to propane would not be cost effective due to the capital costs of conversion. Unless diesel costs hit cost equivalents to over $100/barrel oil and stay there, propane as a substitute for diesel does not appear to be viable.

- Compressed Natural Gas (CNG) is currently being used commercially in Utqiagvik and in Deadhorse. Although CNG has been used as a viable alternative to gasoline, production is limited to locations with natural gas resource, and use is also limited as it is not cost effective to ship. CNG is produced in commercial volume in Prudhoe Bay.

- Coal Bed Methane has been located near Wainwright, and both the U.S. Department of the Interior and U.S. Geological Services have concluded that coal bed methane underlying the area could serve as an alternative energy source for the community. In 2011, NSB received funding from the state to study the feasibility of the production of methane from the coal beds near Wainwright.

- Hydroelectric. Several NSB communities have been identified as having nearby sources for “run of the river” hydroelectric potential, and investigation into potential have been made, with Anaktuvuk Pass being identified as a site that had a potentially economically viable hydroelectric source. However, due to low flow rates and icing during the winter in northern Alaska, hydroelectric energy would only be available during summer months. This lack of generation during high electrical demand periods (winter), combined with high cost of development, makes a hydroelectric development at Anaktuvuk Pass not economically feasible.

- Coal. The North Slope of Alaska contains high quality bituminous and subbituminous coal, which is estimated to be the largest coal resource in the state.

Small scale mining operations have used the coal in the North Slope region since the late 1800s for local resident (home and fish camps) and shipboard use. Many of the coal beds are exposed and close to villages. Coal underlies the villages of Atqasuk and Point Lay. Coal outcrops have also been located within 36 miles of Nuiqsut and Point Hope and coal deposits are indicated 50 miles north of Anaktuvuk Pass. The overburden is estimated to be between zero and 150 feet.

In 2007 - 2008, the U.S. Department of the Interior, with financial and logistical support from ASRC, NSB, and the Olgoonik Corporation, conducted exploratory drilling for coal in Wainwright and the vicinity. They concluded that the coal bed methane (a form of natural gas extracted from coal beds) contained within shallow sub-permafrost coal seams underlying the area could serve as an alternative energy source for the community. The U.S. Geological Service has since conducted additional tests in Wainwright with similar conclusions. In 2011, the borough applied for and received funding from state of Alaska Energy Authority (AEA) for a feasibility study to further investigate production of methane from the coal beds near Wainwright. Known, yet undeveloped, coal and geothermal energy resources are shown in Map 14.
Wind Generation
Wind generated energy may be used for power or heat, or both. Wind systems may be configured to maximize energy for power, plus provide excess energy production that can be captured as heat. This type of system could integrate well with current power systems in the villages, and would avoid some of the issues with heat recovery systems that would be created with non CHP alternative energies.

Meteorological data from NSB villages indicates wind resource class ranging from poor/fair at the inland communities. Wind resource reports have been completed in Point Hope, Wainwright, Atqasuk, Kaktovik, and Anaktuvuk Pass, and Point Lay. Wind – Diesel power Concept Design Reports (CDR) have been completed for Point Hope, Point Lay, and Wainwright. Although Point Hope, Point Lay, and Wainwright were found to have viable wind resource and funding was made available for project design, those funds were either not applied for, or not used and are being returned.

Solar Generation
Solar generation is a possible source of alternative energy for all NSB communities, but there is very little research available for review in the North Slope Borough. Solar energy may be used for power or heat, or both. In July of 2009, a prototype home was installed in Anaktuvuk Pass, which included integrated Solar PV panels. Monitoring by CCHRC indicated that approximately 7 percent of the total electrical demand, which averaged 1,100 kWh/month for the prototype home, was offset by the solar energy. The cost of electricity in Anaktuvuk Pass is approximately $1.05/kWh. The resulting cost savings from solar would be about $80 per month. The cost to install a home solar system is not current; the data available is for the home built in Anaktuvuk Pass in 2009. Without more solar system data and installation costs available for the North Slope region, the true cost is difficult to determine due of high transportation costs. The $80 per month would offset a capital investment of approximately $14,000 over a 25 year life.

Biomass
Alaska’s primary biomass fuels are wood, sawmill wastes, fish byproducts, and municipal waste. Nearly all active biomass systems in Alaska utilize wood or wood waste as fuel. The North Slope environment generally does not support biomass for fuel, although Utqiaġvik has access to substantial municipal waste, and there is wood in the vicinity of Anaktuvuk Pass. At this time, there is no direct research into biomass feasibility in the Northern Arctic.

Electrical Transmission Intertie
An alternative to high cost local area energy production is to intertie power grids to share costs. However, distances between communities are typically too far to be economically practical. To date, the only community that NSB has found to be potentially viable for a transmission line from Utqiaġvik is Atqasuk. In 2011, the North Slope Borough applied for and received funding for an Atqasuk Transmission Line design and permitting.

Hydrokinetic (Tidal) Energy
Tidal and wave energy may eventually prove to be a cost effective energy alternative in Alaska, but the locations found to have potential for tidal/wave energy are generally in latitudes below 60 degrees north. Hydrokinetic energy has not been investigated in the Alaskan arctic and, with the extreme climate, ice conditions and lower energy potential rating, development of
hydrokinetic water technologies in the arctic are not likely within the period of this plan.

**Geothermal Energy**

Currently there are no geothermal energy projects in operation in the region and there are very few recognized thermal springs in the North Slope region. Two are in the northeastern Brooks Range, not near any North Slope communities. The temperatures reported for these springs are relatively low and flow rates have not been measured. Neither of these is close enough to a community to be an exploitable energy resource.

NSB applied for funding to complete a geothermal study near Anaktuvuk Pass in 2011. Alaska Energy Authority rejected the application citing a lack of reliable data to support the existence of usable geothermal resources in the area.

**Community Potential – Alternative Energy Systems**

The following communities have viable potential for alternative energy development, and should see development within the next 20 years:

**Anaktuvuk Pass**

Although Anaktuvuk Pass has been found to have some potential for hydroelectric power, to date it has been found to be non-cost effective. Hydroelectric technologies should be monitored for upgrades that could make it feasible in Anaktuvuk Pass.

**Atqasuk**

Studies have indicated that an overhead electrical intertie to Atqasuk could be a cost effective alternative to local electrical generation. A preliminary design should be completed and used to obtain an updated cost estimate for further evaluation of the cost effectiveness of an intertie.

**Kaktovik**

Kaktovik has been found to have a high wind resource potential, and a wind project design was funded. This project preliminary design should be completed and used to obtain an updated cost estimate for further evaluation of the cost effectiveness of wind energy.

**Point Hope**

Point Hope has been found to have a high wind resource potential, and a wind project design was funded. This project preliminary design should be completed and used to obtain an updated cost estimate for further evaluation of the cost effectiveness of wind energy.

**Point Lay**

Point Lay has been found to have a high wind resource potential, and a wind project design was funded, then cancelled. This project preliminary design should be completed and used to obtain an updated cost estimate for further evaluation of the cost effectiveness of wind energy.

**Wainwright**

Wainwright has been found to have a high wind resource potential, and a wind project design was funded. Then cancelled. This project preliminary design should be completed and used to obtain an updated cost estimate for further evaluation of the cost effectiveness of wind energy.

Table 29 below provides a summary of the pertinent details of alternative energy potential within NSB communities.
Table 29: Alternative Energy

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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk</td>
<td>low</td>
<td>high</td>
<td>low</td>
<td>medium</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>N/A</td>
<td>low</td>
<td>Need feasibility study for Contact Creek hydro</td>
<td>Solar home built</td>
</tr>
<tr>
<td>Pass</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atqasuk</td>
<td>medium</td>
<td>high</td>
<td>unknown - coal resource available</td>
<td>unknown</td>
<td>unknown</td>
<td>unknown</td>
<td>low</td>
<td>N/A</td>
<td>high</td>
<td>potential for electric intertie with Utqiagvik</td>
<td>prelim design and permitting funded for electric intertie</td>
</tr>
<tr>
<td>Utqiagvik</td>
<td>unknown</td>
<td>high</td>
<td>low/med</td>
<td>low</td>
<td>high - using</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td>low</td>
<td></td>
</tr>
<tr>
<td>Kaktovik</td>
<td>high</td>
<td>high</td>
<td>low</td>
<td>unknown</td>
<td>low</td>
<td>unknown</td>
<td>unknown</td>
<td>unknown</td>
<td>low</td>
<td>wind design funded</td>
<td></td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>unknown</td>
<td>high</td>
<td>low</td>
<td>unknown</td>
<td>high - using</td>
<td>unknown</td>
<td>unknown</td>
<td>unknown</td>
<td>low - high</td>
<td>Potential for electric intertie with Alpine</td>
<td></td>
</tr>
<tr>
<td>Point Hope</td>
<td>high</td>
<td>high</td>
<td>low/med</td>
<td>unknown</td>
<td>low</td>
<td>unknown</td>
<td>unknown</td>
<td>unknown</td>
<td>low</td>
<td>CDR done on wind potential</td>
<td>Wind design currently on hold</td>
</tr>
<tr>
<td>Point Lay</td>
<td>high</td>
<td>high</td>
<td>high - coal resource available</td>
<td>unknown</td>
<td>low</td>
<td>unknown</td>
<td>unknown</td>
<td>unknown</td>
<td>low</td>
<td>CDR done on wind potential / coal resource available</td>
<td>Wind design currently on hold</td>
</tr>
<tr>
<td>Wainwright</td>
<td>high</td>
<td>high</td>
<td>unknown</td>
<td>unknown</td>
<td>low</td>
<td>unknown</td>
<td>unknown</td>
<td>unknown</td>
<td>low</td>
<td>CDR done on wind potential</td>
<td>Wind design cancelled</td>
</tr>
</tbody>
</table>
**Areawide Potential – Alternative Energy Systems**

**Develop a Department for Alternative Energy Research, Programs and Funding**

New energy technologies are constantly being developed. These developments could lead to sufficient changes in the costs associated with alternative energy production to make that production feasible. Other factors can affect the cost, such as government policies and requirements. Many alternative energy opportunities exist in NSB, from wind, to solar, to coal, to coal bed methane to natural gases.

NSB should expand the responsibilities of an existing department to foster and develop alternative energy solutions, or create a department solely dedicated to this purpose. The potential economic and environmental gains to be found in alternative energies, or lost potential for not following up alternative energies, are enormous when considering the annual costs associated with providing energy to the villages.

**Incorporate Combined Heat and Power Systems into Alternative Energy Analysis**

In some of the known alternative energy sources, the energy created may be used either to create power, or heat or both. Energies that are utilized in this way are referred to as CHP energy systems. There are many examples of CHP alternative energies, such as solar, wind, biomass, coal, and natural gas. This potential allows for a more efficient utilization of the energy, and a greater potential for cost effectively integrating into existing heat recovery systems. CHP (e.g. a gas-fired plant in Utqiagvik or Nuiqsut) has the benefit of increasing power reliability in the event of grid failure, as it enables each building equipped to operate as a de facto microgrid.

When conducting feasibility analysis of alternative energies, include the opportunity for recovery and use of the by-product in the design and overall project life-cycle costs. Also, include impacts of the conversion to alternative energy to existing waste heat recovery systems in the analysis, evaluating the cost, if any, to upgrade heating systems to allow for the loss (or gain) of waste heat.

**Follow Through on Positive Wind Resource Findings**

Several studies have been conducted to evaluate the potential and, in some cases, the cost effectiveness of wind energy in NSB communities. These studies have identified several villages with wind resource that show high potential and positive cost benefit ratios.

NSB should follow through with design and further cost analysis for the communities that have shown high potential wind resource and, in some cases, positive cost benefit ratios. However, these cost benefit ratios are not strong, and the economics of each site should be further studied before any commitment to construction is made.

**Monitor Research into the Viability of Solar Power**

The amount of research into the viability of solar power as a supplemental energy source is growing. In some Alaska communities and regions, methods of capturing solar energy are being developed and implemented that appear to be cost effective, or at least close to it. In NSB, there has not been adequate solar power research and application to show if there are cost effective applications. However, TNHA has
installed solar thermal collectors on 48 residential units with logging sensors that indicate ample solar resource across the North Slope. Examination of the data from these solar thermal collectors would provide the borough with a better understanding of the viability of solar power in the region.

The availability of solar power in NSB is high during the spring and summertime, and it represents an opportunity for a CHP system. Research is ongoing in regards to both small and large scale solar systems in the arctic. Research is also ongoing regarding heat/power storage systems, which would potentially increase the overall usefulness of solar energy. NSB should continue to monitor and participate in research and development of solar power systems, as it is likely that cost effective technologies currently exist.

Develop Partnerships with Public/Private Development to Foster Development that would Provide Connection to Regional Power and/or Alternative Fuels
As oil development pushes west of Prudhoe Bay, and if exploration resumes in the outer continental shelf of the Chukchi Sea, opportunities may open up for partnering with industry and government to foster access to natural gas, or other alternative fuel products, as it becomes available locally. Additionally, this exploration and development may provide the extension of roads and infrastructure, such as power interties, as part of the development.

Continue to Monitor New Technologies in Coal Fired Energy
Coal fired power generation is quickly ramping down in the United States, due mostly to the availability of natural gas for fuel and tightening environmental restrictions on emissions. However, arctic Alaska is has special and unique issues when it comes to energy, and NSB has an abundance of coal that, in some cases, is very near to villages. As such, NSB should continue to monitor coal burning technologies. Should small scale, clean burning coal fired power generation technology become available, a cost benefit analysis should be made to see if it could be a viable alternative to diesel fuel.

COMMUNITY INPUT, FINDINGS, NEEDS, AND CHALLENGES
Diesel generated electricity, the primary source of heat in most of the North Slope villages, is costly. Diesel fuel is either transported via barge or flown into villages, which increases the cost dramatically. The majority of the cost is borne by the borough (information on borough subsidies is provided in Chapter 7: Public Facilities). Investigating the feasibility of using alternative energy sources, such as extending natural gas, already in use in Nuiqsut and Utqiagvik, would help remediate those costs. There is also potential to develop other energy sources, such as wind and solar. Other types of alternative energy are unlikely to be developed within this plan’s planning horizon – biomass, hydrokinetic, or geothermal.
Energy issues and concerns identified by workshop participants are provided in Chapter 2 and listed below:

- Dependence on fossil fuels and logistics of fuel delivery
- Undeveloped mineral deposits on the western side of the borough
- Regional power plant
- The North Slope has abundant natural gas reserves
- Lack of renewable/alternative energy resources
- Lack of energy redundancy
- Explore renewable resource options
- Regional power plant: energy corridors and inter-village connect
- Natural gas development for other communities that desire alternative energy source

### Findings

- High fuel costs due to transportation and facility operation increases costs for residents of the North Slope Borough.
- The cold climate creates freezing issues for public facilities and increases energy needs and costs.
- Home weatherization can reduce costs for homeowners and the North Slope Borough yet very few home audits have been performed.

### Needs & Challenges

- Limited availability of natural gas and infrastructure in most villages requires the use of diesel which must be transported to each village and increases both operational costs and the risk of leaks and spills that cause significant environmental damage.
- High fuel costs including transportation costs increase heating costs for most residents on the North Slope Borough communities.
- Increased efficiency is needed to decrease costs of maintaining water and sewer infrastructure at lower costs.
- Lack of funding prevents necessary upgrades to increase efficiency in metering. As funds become available, upgrade projects are initiated.
- There is potential to increase the borough’s energy independence by developing alternative energy sources, reducing reliance on diesel fuel transported from outside the North Slope.
- Heat recovery can be better utilized to save costs.
- All of the NSB communities have potential for energy efficiency upgrades including residential smart meters and power distribution metering upgrades.
- Home weatherization is needed for many of the region’s older housing stock to increase efficiency and reduce costs.
**PRIMARY ENERGY GOAL**

Goal Nine: Attain energy independence and energy security.

Objective 1: Develop alternative and redundant energy sources.

9.1.1. Extend natural gas to villages where practicable.

9.1.2. Continue research into alternative energy sources, and implement where feasible.

9.1.3. Research and develop alternative energy sources for borough communities, such as coal, natural gas and wind power.

9.1.4. Construct redundant energy development and distribution to ensure continuity of service.

Objective 2: Develop regional energy plans.

9.2.1. Investigate developing energy corridors between communities for regional power distribution.

9.2.2. Cultivate partnerships with public/private development to foster development that would provide connection to regional power.

Objective 3: Seek energy efficiency upgrades.

9.3.1. Ensure regular maintenance and efficiency improvements of power plants.

9.3.2. Implement a program to regularly inspect and weatherize buildings for maximum energy savings.

9.3.3. Utilize waste heat recovered from community power generation.
Chapter Eleven
Housing
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The communities across the North Slope and throughout Alaska struggle with housing issues—safe, sanitary, available, and affordable housing for residents. All of the North Slope villages are experiencing a shortage of housing of all types. A lack of affordable housing is exacerbated by the lack of rental housing and homeownership opportunities in all villages.

Housing is a complex issue across the entire North Slope. It is the convergence of many factors including complex land ownership and the borough’s remote location that contribute to the region’s lack of housing availability and affordability as well as the high rates of overcrowding. With high growth, the population is expected to grow by 2,886 people by the year 2035. A low growth rate would result in approximately 1,262 additional residents. With this anticipated increase, the complexity of housing issues needs to be addressed to comfortably accommodate both the current and future populations.

This chapter identifies and describes the current housing issues and those related to the projected growth. But as the acute lack of housing continues to plague the region, this chapter cannot substitute the need for a study that investigates housing issues in depth and provides an array of potential solutions.

### Existing Conditions

#### Housing Inventory

According to the NSB 2015 Economic Profile and Census Report (NSB Census), there are approximately 2,609 total dwelling units throughout the communities of the North Slope, an increase of 244 housing units (10.3 percent) from 2010. The NSB Census reported in 2015 that 48 housing units were under construction in Utqiaġvik but did not report any homes under construction in any other village. However, the regional housing authority, Tagiugmiullu Nunamiullu Housing Authority (TNHA), reported constructing 24 homes in North Slope villages between 2013 and 2015.\(^{235}\)

The 2015 housing occupancy rate is 96.9 percent; 3.1 percent of housing units are unoccupied. The largest vacancy rate is in Nuiqsut at 14.8 percent, followed by Atqasuk.
(14.8 percent); Point Lay (3.9 percent), Wainwright (3.7 percent), Utqiaġvik (3.1 percent); Anaktuvuk Pass (1.6 percent); and Point Hope (.04 percent). Kaktovik has the lowest housing vacancy rate at 0 percent.\textsuperscript{236}

The Alaska Housing Finance Corporation (AHFC) reports a slightly different number of housing units and a higher vacancy rate than presented in the 2015 NSB Census. The AHFC 2017 Alaska Housing Assessment – North Slope Borough Summary indicates that in 2017 there were 2,513 housing units on the North Slope, with an overall vacancy rate of 4.7 percent.\textsuperscript{237} The 2012 – 2016 American Community Survey 5-Year Estimates indicate that the borough has 2,550 housing units.\textsuperscript{238} Although there are differences in the estimated number of housing units, all three estimates - from the NSB Census, AHFC, and U.S. ACS 5-Year Estimates - are within 100 housing units of each other. The vacancy rates provided by both the 2015 NSB Census and the AHFC are both low, indicating that there is an unmet for housing across the North Slope and that finding a home for rent or to purchase is difficult.

Table 30: 2015 North Slope Housing Units by Village\textsuperscript{239, 240}

<table>
<thead>
<tr>
<th>Community</th>
<th>Total Housing Units*</th>
<th>Single Family</th>
<th>Duplex</th>
<th>Multifamily</th>
<th>Under Construction (2015)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>122</td>
<td>104</td>
<td>2</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>81</td>
<td>72</td>
<td>8</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Kaktovik</td>
<td>107</td>
<td>97</td>
<td>2</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>138</td>
<td>122</td>
<td>0</td>
<td>16</td>
<td>5</td>
</tr>
<tr>
<td>Point Hope</td>
<td>230</td>
<td>212</td>
<td>4</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>Point Lay</td>
<td>74</td>
<td>67</td>
<td>0</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Utqiaġvik</td>
<td>1,638</td>
<td>959</td>
<td>246</td>
<td>379</td>
<td>48</td>
</tr>
<tr>
<td>Wainwright</td>
<td>186</td>
<td>171</td>
<td>0</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

* The total housing units include the number provided by the 2015 NSB Census and the number of Under Construction units provided by TNHA.

** The number of Under Construction homes in Utqiaġvik is from the 2015 NSB Census; all other figures were provided by TNHA.


\textsuperscript{240} Hagle, Griffin. 2018. Chief Executive Officer. Taġiuġmiullu Nunamiullu Housing Authority. Personal Communication.
Housing Type
The majority of North Slope residents in all communities, nearly 75 percent, live in single family homes while 23.6 percent live in multifamily buildings (including duplexes, triplexes, and larger building). Mobile homes were prevalent in most communities in 2003, accounting for 3.5 percent of the living structures in use, as shown in Table 31. In 2010, mobile homes increased by 61 percent to 9 percent of all housing structures. However, by 2015 the number of mobile homes dropped significantly to 0.8 percent. While some mobile homes could have been missed during the 2015 census, possibly due to extreme weather conditions, their use as a type of living structure has clearly declined in all communities over the last twelve years.241 However, the reason for the disappearance of mobile homes given the dire need for housing is unclear.

The North Slope Borough owns and manages one bedroom elder housing five-plexes in several North Slope villages. HUD originally constructed the five-plexes. Due to strict income restrictions, many North Slope residents did not qualify to rent an apartment, even though sometimes a residents’ sole income was Native corporation dividends. The NSB subsequently purchased the five-plexes with TNHA providing management services. Since the reestablishment of the NSB Housing Department, the NSB has taken over management of the units.

Table 31: Housing Type, 2003, 2010, 2015242

<table>
<thead>
<tr>
<th>Type of Housing</th>
<th>2003</th>
<th>2010</th>
<th>2015</th>
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</thead>
<tbody>
<tr>
<td>Mobile Home</td>
<td>3.5%</td>
<td>9.0%</td>
<td>0.8%</td>
</tr>
<tr>
<td>Single Family Home</td>
<td>72.4%</td>
<td>68.8%</td>
<td>74.9%</td>
</tr>
<tr>
<td>Building for 2 families</td>
<td>6.9%</td>
<td>7.6%</td>
<td>9.0%</td>
</tr>
<tr>
<td>Building for 3 or 4 families</td>
<td>6.1%</td>
<td>3.6%</td>
<td>*</td>
</tr>
<tr>
<td>Building for 5 or more families</td>
<td>9.6%</td>
<td>9.3%</td>
<td>14.6%*</td>
</tr>
<tr>
<td>Other</td>
<td>1.5%</td>
<td>1.8%</td>
<td>0.8%</td>
</tr>
</tbody>
</table>

* Building for 3 or 4 families were included in the 5 or more categories in the 2015 survey

Housing Conditions
North Slope residents are concerned about the condition of much of the region’s housing stock, including overall condition and age, drafts and ventilation, and type of construction. Residents are concerned that many homes on the North Slope are unsuitable for habitation today and that conditions will be exacerbated in the future without intervention. Many homes were constructed with a post and pad foundation and may require releveling due to changes to the underlying permafrost from ground thaw. Many homes are also in need of renovations, including air quality assessments and energy efficiency upgrades.

242 Ibid
The 2003 NSB Census does not provide data on the average housing size. However, in 2010 the average square footage of 909 housing units surveyed in the North Slope Borough was 1,139 square feet. In 2015, the average housing unit was 1,188 square feet. The AHFC Housing Assessment for 2017 provides similar average sizes at 1,171 square feet for single family homes and 1,034 square feet for multi-family homes. It is evident that although housing sizes on the North Slope have grown slightly over the five year period, North Slope homes are overall significantly are smaller than both the Alaska and national average.

Housing construction was a thriving industry on the North Slope during the 1970s and 1980s. Nearly 26 percent of the total housing stock was constructed between 1970 and 1979 and 30 percent between 1980 and 1989. Another 13.4 percent was constructed prior to 1970. Nearly 70 percent of all housing across the North Slope was built at least twenty nine years ago, with some homes as old as 80 years or more. More recently, less than 10 percent of the current housing stock has been constructed over the last 18 years, since 2000. New housing, those built since 2010, accounts for a mere 0.6 percent of all housing across the North Slope.

The age of the housing stock is evident when examining the inefficiency of older housing. The AHFC 2017 Alaska Housing Assessment Summary for the North Slope indicates that approximately 93 occupied homes (5 percent) are estimated to have a 1-Star home rating, the least efficient rating. A 1-Star home uses approximately four times more energy than if a home is built to AHFC’s Building Energy Efficiency Standard (BEES) which sets building energy use standards for thermal resistance, air leakage, moisture protection, and ventilation. Older homes built before 1980 that have not been retrofitted are potentially in need of energy efficiency upgrades. Approximately 33 percent of all homes in the North Slope Borough are estimated to need upgrades, lower than the Alaska average of 39 percent.

Single-family homes on the North Slope Borough consume an average of 189 million British Thermal Units (BTU) per year; multi-family units consume an average of 154 million BTUs annually. For single family homes, the average annual energy consumption is 83 percent of the Alaska average of 227 million BTUs. For multi-family units, the average annual energy consumption is approximately the same as the Alaska average of 156 million BTUs. Both single family and multi-family housing energy consumption is 1.8 times the national average.


248 Ibid

249 Ibid
Energy costs for single-family homes average $4,088 annually, which are 98 percent of the Alaska average and 1.8 times the U.S. average while energy costs for multi-family housing units is $2,048 annually, 71 percent of the Alaska average and 1.6 times the U.S. average.²⁵⁰ Energy usage and costs for both single family homes and multi-family units are below average, even if only slightly, than the Alaskan average. But compared to the U.S. averages, both usage and cost are significantly higher for both types of housing on the North Slope. The extreme weather conditions are likely the reason for much of the increase, although the lack of energy efficient housing could also account for increased usage.²⁵¹

**Overcrowding**

The rate of overcrowding is a frequently used indicator to assess housing affordability, economic health, and the quality of life within a community. A commonly accepted definition of overcrowding and one used by the United States Census Bureau is more than one person per room; severe overcrowding is defined as one and a half people per room.

In rural Alaska, however, homes often become overcrowded because they absorb friends or family members that would otherwise be homeless. As the president/CEO of the Bering Straits Regional Housing Authority, Christopher Klolerok, points out during a 2018 housing forum held in Savoonga, “…unsheltered homelessness would lead to death during the fierce winter weather. Rooted in a close-knit culture and deep familial links, many families prefer to house people in need, and live in severe overcrowding, rather than let individuals risk certain death if they are unsheltered... Overcrowded housing and the lack of housing are interchangeable conditions in rural Alaska. The lack of safe, sanitary and affordable housing threatens the survival of Native cultures and the villages and towns many Alaska Natives call home. For American Indians and Alaska Natives, overcrowded housing is a manifestation of what would be unsheltered homelessness in other parts of the country.”²⁵²

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²⁵⁰ The AHFC Assessment methodology reports that energy cost data was obtained from the 2014 AHFC Assessment completed by the Cold Climate Housing Research Center and from the Alaska Retrofit Information System (ARIS) database. Neither of these sources indicate whether or not energy costs include NSB subsidies. This plan assumes that since the NSB was not included as a reference, the energy costs presented do not consider NSB subsidies.


The 2015 average household size on the North Slope was 3.63. Among Iñupiat households, the average size was 3.93, 4.17 for Filipinos, and 2.11 for Caucasians. The community with the largest Iñupiat household size is Point Hope at 4.2 people per household, followed closely by Nuiqsut at 4.1. The lowest average Iñupiat household size was Point Lay, at 3 people per household.254

Despite the 2015 NSB Census data on household size presenting moderate average household sizes, the number of people residing in one home has increased over the last two decades. Across the North Slope, the number of households with nine or more occupants has increased from 13 in 1998 to 28 in 2003; to 47 in 2010; and finally to an extrapolated 49 in 2015.255 Several factors may explain the reasons for the increase in this category of household size, among them the lack of available housing on the market and thus overcrowding in some units.

The most significant changes in household size since 2010 have occurred in Utqiagvik. The percentage of those living in households with four or fewer residents has dropped from three-fourths to 69 percent. The average number of people in Iñupiat households has increased from 3.59 to 3.94 per household, while Caucasian households have decreased from an average of 2.41 people in 2010 to 2.27 people in 2015. The average number of people in Filipino households has increased from 3.66 to 4.24256 and the average for all ethnicities has increased from 3.3 to 3.62.257

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253 Total of households does not match total number due to sample size
255 Ibid
256 A major reason is in part is a 20-person Filipino household in 2015 in Utqiagvik.
The 2012 - 2016 American Community Survey 5-Year Estimates indicate that 18.2 percent of North Slope Borough households are overcrowded and 11.8 percent are severely overcrowded. By comparison, the national average for overcrowding and severe overcrowding is 2.3 percent and 1 percent, respectively. In 2014, TNHA conducted a study on North Slope housing issues. The study reported that 665 families in the seven outlying villages were living in overcrowded conditions. At community meetings during village comprehensive planning, residents have consistently voiced concern about the lack of housing availability for rent or purchase and the prevalence of two and three generations living together in one home. Overcrowding rates are shown in Figure 14.

Low vacancy rates, data from the AHFC and both the U.S. and NSB census, and anecdotal evidence suggests that the housing market is tight and that more homes need to be constructed or rehabilitated to ease the pressure.

**Housing Affordability**

HUD defines affordable as housing that costs no more than 30 percent of a household’s monthly income. The median household income estimated by the 2012-2016 ACS 5-Year Estimate is $72,027. Based on HUD’s 30 percent affordability threshold, the average family should not spend more than approximately $21,608 annually or $1,801 monthly on housing, including rent or mortgage and utilities. The median monthly homeowner costs are estimated at $1,196 and the median gross rent is estimated at $1,087. The NSB Census does not provide information on the percentage of households that are housing cost burdened. However, the American Community Survey 5-Year Estimates indicates that 24.6 percent of renters and 14.6 percent of homeowners pay more than 30 percent of their income in housing costs. Interestingly, over 7.8 percent of those homeowners without a mortgage are still housing cost-burdened, meaning they pay more than 30 percent of their income on housing expenses. A comparison of home affordability is provided in Figure 15. This chart indicates that there is greater percentage of households that are cost burdened in Alaska and the United States than in the North Slope. U.S. Census figures indicate there are few cost-burdened households across the North Slope, the Census does not consider the great expense required to maintain older homes in the Arctic, including the expense of shipping materials and hiring qualified tradespeople to provide repairs. Additionally, overcrowded households may report a higher income because there are more workers under the same roof. Eliminating overcrowding may reveal that households are significantly more cost burdened than the U.S. Census figures illustrate.

In 2015, iñupiat households have experienced an increase in homeownership over the last twelve years.
years. In 2003, 58 percent of Iñupiat households owned homes; by 2015, that percentage had increased to nearly 67 percent. For non-Iñupiat households, the homeownership rate remained steady over the twelve year period: 27 percent in 2003 and 26.9 percent in 2015. Free and clear homeownership has increased for both Iñupiat and non-Iñupiat households over the same time period; in 2003, 29.5 percent of Iñupiat households owned their homes outright, increasing significantly to 47.5 percent in 2015. Non-Iñupiat free and clear homeownership rates increased over the same period – from 8 percent to 11.8 percent over the same time period.

Figure 15: Housing Costs as a Percent of Income

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HOUSING AUTHORITIES

Tagiugmiullu Nunamiullu Housing Authority

TNHA offers housing assistance across the North Slope. It is a Tribally Designated Housing Entity (TDHE), established in 1974 by state statute to address housing needs of Tribal citizens and other residents of the North Slope. The TDHE designation allows TNHA to receive federal grant funds and provide housing assistance under Native American Housing Assistance and Self-Determination Act (NAHASDA). The passage of this 1996 legislation reorganized housing assistance provided by HUD by replacing separate housing assistance program with one block grant program.

TNHA currently has three housing programs:

1. TNHA Fair Market Rental (FMR) Program. Rent schedules are established and subject to change with market values. These rentals are available to all residents subject to availability.

2. TNHA Low-Rent Housing Program. Provides affordable housing to qualified low-income Alaska Native/Indian families at a cost within their means. Non-Indian families may receive this assistance if they are “essential to the well-being of Indian families” in the community. HUD sets income limits that determine eligibility for assisted housing programs based on Median Family Income estimates and Fair Market Rent area definitions for different areas of the country. HUD’s 2018 income limits for a family of four are set at: $66,550 for low income (80 percent of the Area Median Family Income); $41,600 for very low (50 percent of the Area Median Family Income); and $31,380 for extremely low (30 percent Area Median Family Income).

3. TNHA Mutual Help NAHASDA Lease-Purchase Homeownership Program. Provides homeownership opportunities for qualified lower income Alaska Native/Indian families at a cost within their means.

In order to address the need for affordable, sustainable, energy efficient homes, the Cold Climate Housing Research Center (CCHRC), in partnership with the TNHA, designed a prototype home for construction in Anaktuvuk Pass. CCHRC is a nonprofit corporation that facilitates the use of energy-efficient and cost-effective building technologies for the circumpolar regions. The home was designed to utilize lightweight materials and energy efficient plumbing and heating systems to significantly reduce energy costs. The Anaktuvuk Pass home was constructed in 2009. TNHA has built homes...

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in nearly every community across the North Slope. Indian Housing funds were used to construct the CCHRC homes in the villages.

TNHA’s recently constructed homes are designed with a post-on-pad foundation that rests on the ground that isolates the house from the soil to prevent heat from accelerating permafrost thaw. These TNHA homes have also been designed to be easily relocated if needed, such in the case of flood or subsidence. The foundation has sliding steel posts attached to pads that can be adjusted up to eight feet in height to accommodate tundra movement. Beams that act as skids enable the home to be towed to a new location if needed. The home’s design also includes adequate ventilation to ensure healthy indoor air quality, which is often a challenge in very cold climates because humid indoor air tries to escape through the building envelope and condenses on cold surfaces inside the wall, potentially leading to mold and rot.  

While new housing is needed in all North Slope communities, there are some concerns with the new CCHRC homes. Many residents do not qualify for a home purchase because of the stringent low income requirements imposed by HUD. Wage work and dividends will often bring a household’s annual earning above the maximum income limits to purchase a home. Additionally, some residents and the NSB are concerned the use of independent wastewater treatment systems, which discharge effluent is discharged directly onto tundra, often causing environmental issues like odor, erosion, and permafrost thaw.

Native Village of Barrow

Like TNHA and NVPHO, the Native Village of Barrow (NVB) is a TDHE that administers a NAHASDA program. The NVB has three housing programs: new construction, housing renovations, and emergency repairs. There is currently a waiting list to purchase a new homes

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or have renovations through this program. The emergency repair program is on a first-come first-serve basis. Many of the homes that have been repaired by NVB were deteriorated, often with little to no insulation, dated electric systems and single pane windows.

Native Village of Point Hope

The Native Village of Point Hope (NVPH) also administers housing programs within the Point Hope community using Indian Housing Block Grant (IHBG), a formula based grant program; and the Title VI Loan Guarantee, that provides financing guarantees to Indian tribes for private market loans to develop affordable housing, both offered through HUD’s NAHASDA program.267

The NSB Housing Department

The North Slope Borough created the Housing Solutions Group in 2011 after concerns were raised by both the NSB Assembly and citizens regarding short-term and long-term housing issues region-wide. The Housing Solutions Group provided financial and outreach services as well as collaboration and coordination with housing providers to assist residents in purchasing or constructing a home.268

In a more recent response to the housing crisis, NSB resurrected the Housing Department in 2017. When the housing department closed a decade ago, its responsibilities were moved to TNHA. Now the two entities are coordinating the best way to align their funding and programs to have the most benefit for North Slope residents. The functions and activities of the Housing Solutions Group are being transferred to the Housing Department to streamline housing activities within the borough.

The Housing Department seeks to develop, maintain, and make available affordable housing options for all residents. The Department offers assistance with renovations and upgrades, often ones that are necessary to make a housing unit habitable; managing rental properties; and purchasing or building housing units that can house residents.269

CURRENT AND FUTURE HOUSING NEEDS

There is a housing shortage across the North Slope that often results in multiple generations and families residing in the same household in overcrowded conditions.

The North Slope’s anticipated population growth will result in more households and an increased

demand for housing in addition to an already critical need for extra housing. The need and demand for housing, both present and in the future, relies on population projects presented in Chapter 4 and housing vacancy and overcrowding rates.

In 2015, there was a combined estimated shortfall of housing in the seven villages of 331 homes.270 Utqiagvik also had unmet housing need of approximately 306 homes,271 with a total unmet need for the North Slope Borough of 637 housing units.

Without additional housing construction, the cumulative unmet regional need for housing will total between 753 - 891 homes in 2020 and between 1,104 and 1,704 in 2035, depending on the population growth rate. The growth rate in all communities may be hampered by the inability to find a place to live. Table 32 and 33 present future housing needs for high and low population growth rates.

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### Table 32: High Growth Housing Need Forecast

<table>
<thead>
<tr>
<th>Location</th>
<th>Base Year Estimates 2015</th>
<th>5 Year Forecast 2020</th>
<th>10 Year Forecast 2025</th>
<th>20 Year Forecast 2035</th>
</tr>
</thead>
<tbody>
<tr>
<td>Villages</td>
<td>2,882</td>
<td>331</td>
<td>2,955</td>
<td>27</td>
</tr>
<tr>
<td>Utqiagvik</td>
<td>4,825</td>
<td>306</td>
<td>5,065</td>
<td>89</td>
</tr>
<tr>
<td>Total</td>
<td>7,707</td>
<td>637</td>
<td>8,020</td>
<td>116</td>
</tr>
</tbody>
</table>

### Table 33: Low Growth Housing Need Forecast

<table>
<thead>
<tr>
<th>Location</th>
<th>Base Year Estimates 2015</th>
<th>5 Year Forecast 2020</th>
<th>10 Year Forecast 2025</th>
<th>20 Year Forecast 2035</th>
</tr>
</thead>
<tbody>
<tr>
<td>Villages</td>
<td>2,882</td>
<td>331</td>
<td>3,029</td>
<td>54</td>
</tr>
<tr>
<td>Utqiagvik</td>
<td>4,825</td>
<td>306</td>
<td>5,365</td>
<td>200</td>
</tr>
<tr>
<td>Total</td>
<td>7,707</td>
<td>637</td>
<td>8,394</td>
<td>254</td>
</tr>
</tbody>
</table>
COMMUNITY INPUT, FINDINGS, NEEDS, AND CHALLENGES

All North Slope communities are experiencing housing-related issues. The primary issue is the lack of housing. Vacancy rates are low, often resulting in several households living in one home. Housing is also not always affordable; the lack of steady employment opportunities, especially in the villages, makes renting or buying a home, if there is one available, financially out of reach for many residents. The cost to construct even a modest home can cost well over $500,000. TNHA reports the total development cost per square foot cost can range from $448 (in Nuiqsut) to $660 (in Point Lay) or even more; a 1,500 square foot home can cost between $672,000 to $990,000, depending on the village. These issues, coupled with generally poor housing conditions due to both the age of the housing stock, the expense of maintaining homes in such a remote and harsh environment, and the lack of qualified tradespeople to make repairs, have all contributed to the region’s crippling housing market.

Housing issues and concerns identified by workshop participants are provided in Chapter 2 and listed below:

- Funding for homes and renovations on Native restricted lots is difficult
- It is expensive to construct roads to lots and connect homes to services
- Probate issues limit use of many Native restricted lots
- Federal housing subsidies are inadequate for the need
- Overcrowding
- Dilapidated housing conditions
- The North Slope is one of the few regions in state that does not have a coalition established to address housing and homelessness issues
- Limited collaboration amongst organizations
- Overdependency on the North Slope Borough
- Building design standards for the Arctic are yet to be implemented and enforced
- There is not a regional coalition to address homelessness
- Dilapidated housing conditions
- NSB titles 17, 18, 19 could incorporate building standards and/or a building official
- Storefront for equipment and tools loans and technical assistance for making repairs
- Create a Alaska Native Homeownership Coalition creation for a one-stop shop for grant and loan opportunities for homeownership
- Utilize existing vacant or underutilized lots that already have road access and proximity to piped water/sewer
- Construct modular homes on the North Slope that are easier to transport
- North Slope Borough Municipal Code could be amended to have a two tier sales process for lower income and middle/higher incomes for home purchases
- Provide education on the costs of building and maintaining homes
- Incentivize private developers to invest in housing
- Road connections to the villages could lower material costs
• Condos or zero lot line homes for those that wish to purchase a starter/less expensive home
• More rental properties
• Asbestos and lead paint contamination in older homes
• Alaska State Legislature perceives that there is not a homeless issue on the North Slope
• Current housing situation is having severe negative social, health, and mental health impact on communities

### Findings

The low rate of housing availability contributes to the region’s high rate of lack of housing and overcrowding and puts a strain on many households.

Complex land ownership and the borough’s remote location that contribute to the regions lack of housing availability and affordability as well as the high rates of overcrowding and homelessness.

Many homes in the North Slope Borough are constructed of post and pad foundations which require releveling periodically due to shifting permafrost.

Nearly 70 percent of the total housing stock was constructed almost 30 years ago; less than 10 percent has been constructed over the last 18 years.

Aging housing stock requires increase maintenance, are not as energy efficient as newer produced homes which creates increased energy costs.

Older homes built before 1980 that have not been retrofitted are potentially in need of energy efficiency upgrades.

It is costly to maintain older homes in the Arctic, primarily due to the expense of shipping materials and hiring qualified tradespeople to provide repairs.

At least 1,705 additional homes will be needed across the North Slope by 2035 to alleviate the current housing shortage and accommodate new residents. (low growth projection).

### Needs & Challenges

In some villages, shifting permafrost and building foundations require additional work that must be performed to make homes habitable.

Independent wastewater treatment systems, which discharge effluent is discharged directly onto tundra, often causing environmental issues like odor, erosion, and permafrost thaw.

The North Slope’s anticipated population growth will result in more households and an increased demand for housing in addition to an already critical need for extra housing.

Remedying probate issues will help in developing more housing on currently unused and under used lots.
PRIMARY HOUSING GOAL

Goal Three: Develop a housing program to address dilapidated infrastructure and housing shortage.

Objective 1: Develop a policy on the borough’s role in public and private housing.

3.1.1. Establish a coalition to address housing and homelessness issues on the North Slope to coordinate programs and initiatives.

Objective 2: Promote development of new public and private housing.

3.2.1. Encourage duplexes, triplexes, and larger multi-family house to provide more affordable housing options.

3.2.2. Amend the zoning ordinance to allow condominiums and zero lot line homes to increase the range of affordability options.

3.2.3. Identify and explore the applicability of housing alternatives that allow for accessory dwelling units and smaller housing units to meet the demand for smaller and more affordable housing.

3.2.4. Encourage the use of existing public infrastructure by focusing housing development on infill, vacant, and underdeveloped land.

3.2.5. Extend roads and utilities to lots to facilitate more housing development when and where feasible.

3.2.6. Seek alternative funding sources for constructing homes on Native restricted lots.

3.2.7. Investigate the feasibility of constructing modular or 3-D printed homes on the North Slope that are easy to transport to villages and to lots.

3.2.8. Research incentivizes for private developers to invest in housing on the North Slope.

3.2.9. Work with housing authorities to construct additional rental housing to expand housing choice.

3.2.10. Seek solutions to village senior housing five-plexes that are not being fully utilized.
Objective 3: Create programs to address dilapidated housing conditions, weatherization upgrades, air quality and general home repairs.

3.3.1. Support programs that help with weatherization and sustainability measures to reduce home operating costs for water and energy usage.

3.3.2. Seek and/or allocate funding for home maintenance assistance to benefit low-income, disabled residents, and Elders with ongoing maintenance needs.

3.3.3. Seek funding to help provide repairs to the most critical homes needing repairs and air quality improvements to make them healthy for habitation.

3.3.4. Work closely with Tribal, city, and Native corporations to establish village storefronts to loan equipment and tools and offer home repair technical assistance.

Objective 4: Assist residents in obtaining financing and resolving probate issues.

3.4.1. Support financial education and financial management programs that help residents understand the true costs of homeownership and assist in navigating the process of buying, maintaining, and keeping homes.

3.4.2. Create an Alaska Native Homeownership Coalition for a one-stop shop for grant and loan opportunities for homeownership.

3.4.3. Advocate state congressional representatives in the United States to seek exceptions to the income limit for federal housing subsidies for rural Alaska.

3.4.4. Offer guidance and assistance in remedying restricted property probate issues to better utilize existing lots, including parcel research and assistance in obtaining consensus with multiple heirs.

Objective 5: Create programs to address homelessness.

3.5.1. Investigate the costs and feasibility of establishing homeless shelters in Utqiagvik and the villages.

3.5.2. Support transitional homes for families that have experience a fire, flood, or other emergency that does not allow them to live in their home.
Chapter Twelve
Education
The North Slope Borough’s first Mayor, Eben Hopson, Sr. delivered a powerful speech on the Iñupiaq education, aired on television from (then) Barrow On December 19, 1975, three years after the formation of the North Slope Borough. The speech was given at a time when the Barrow Education Association, the local National Education Association (NEA) teacher union affiliate, had begun its annual contract negotiations. The following are excerpts of the speech given by the visionary North Slope Borough leader that provides the foundation of education on the North Slope.

“We Iñupiaq are a nation of people occupying the circumpolar Arctic from Siberia through Alaska and Canada to Greenland. We share common values, language, culture and economic systems. Our culture has enabled us to survive and flourish for thousands of years in the Arctic where no other man or culture could. Among our entire international Iñupiat community, we of the North Slope are the only Iñupiaq who have achieved true self-government with the formation of the North Slope Borough. We have the greatest opportunity to direct our own destiny as we have for the past millennia.

Possibly the greatest significance of home rule is that it enables us to regain control of the education of our children. For thousands of years, our traditional method of socializing our youth was the responsibility of the family and community. From the first, visitors to the Arctic have universally commented on the warm disposition of our children. Corporal punishment was absolutely unknown. Boys and girls began their education with their parents and, by the time they reached their teenage years, they had mastered the skills necessary to survive on the land here. From that time forward, the youth – with his family and within his community – devoted his attention to his intellectual and social growth.

Eighty-seven years ago, when we were persuaded to send our children to western educational institutions, we began to lose control over the education of our youth. Many of our people believed that formal educational systems would help us acquire the scientific knowledge of the western world. However, it was more than technological knowledge that the educators wished to impart. The educational policy was to attempt to assimilate us into the American mainstream at the expense of our culture. The schools were committed to teaching us to forget our language and Iñupiat heritage. There are many of you parents who, like me, were physically punished if we spoke one Iñupiat word. Many of us can still recall the sting of the wooden ruler across the palms of our hands and the shame of being forced to stand in the corner of the room, face to the wall, for half an hour if we were caught uttering one word of our native language. This outrageous treatment and the exiling of our youth to school in foreign environments were to remain the common practices of the educational systems.

For eighty-seven years, the BIA tried to destroy our culture through the education of our children. Those who would destroy our culture did not succeed. However, it was not without cost. Many of
our people have suffered. We all know the social ills we endure today. Recently, I heard a member of the school personnel say that many of our Inupiaq children have poor self-concepts. Is it any wonder, when the school systems fail to provide the Inupiaq student with experiences which would build positive self-concepts when the Inupiat language and culture are almost totally excluded?

Today, we have control over our educational system. We must now begin to assess whether or not our school system is truly becoming an Inupiat school system, reflecting Inupiat educational philosophies, or, are we in fact only theoretically exercising "political control" over an educational system that continues to transmit white urban culture? Political control over our schools must include "professional control" as well, if our academic institutions are to become an Inupiat school system able to transmit our Inupiat traditional values and ideals. My children and yours spend many hours in school each day, 180 days each year for 12 years. Today, the socialization process of our youth includes the formal instruction received in our school system. It is precisely because of this that our school system must reduce the difference between the language and culture of the home and that of the school.

We must now achieve "professional control" by examining the teacher and content of instruction. We must have teachers who will reflect and transmit our ideals and values. We must have Inupiaq-centered orientation in all areas of instruction. I do not want my children to learn that we were "discovered" by Columbus or Vitus Bering. I do not want to hear that we were barbaric or "uncivilized." I do not want our children to feel inferior because their language and culture are different from those of their teacher. I do not want to see school planning surveys which list hunting, fishing, whaling or trapping as a "social" or "recreational" activity.

We must develop a teacher recruitment and training program to satisfy our needs.
1. Foremost, we must encourage and train our own Inupiaq to become teachers.
2. Recruit responsive teachers who are willing to learn both the Inupiaq language and our cultural values.
3. Train teachers and offer financial incentives to those who become proficient in our language and culture, in addition to Inupiat history and ideologies.
4. Evaluate current teachers to insure Inupiat educational philosophies are being implemented.

It is important to remember the lessons of the past. In addition, we must search and master the new changes if we are to continue to dominate the Arctic. We have demonstrated we can survive the trespasses which have been perpetuated upon us. We have been successful in establishing our own home rule government. We have been able to achieve self-government. We must strive to insure that our Borough, our city governments and our school systems reflect our Inupiat ideals. We are Inupiaq.

Eben Hopson, Sr., Mayor, North Slope Borough

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NORTH SLOPE BOROUGH SCHOOL DISTRICT

The North Slope Borough School District provides education for students from pre-kindergarten through 12th grade. The school district is governed by a seven member Board of Education with four seats for Utqiagvik, one seat for Point Lay and Point Hope, one seat for Wainwright and Atqasuk, and one seat for Kaktovik, Nuiqsut, and Anaktuvuk Pass.273

The NSBSD focuses on learning rooted in the value, history and language of the Iñupiat as envisioned by Eben Hopson, Sr. The school district seeks for its students to become critical and creative thinkers able to adapt in a changing environment and world while envisioning, planning, and taking control of their destiny. Students should become active and contributing members of their communities.274

There are eleven schools within the North Slope School District. There is one school in each of the seven communities and four in Utqiagvik, the regional service center of the North Slope Borough.275 The village, school, and current enrollment are listed in Table 34.276

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Table 34: North Slope Schools and Enrollments

<table>
<thead>
<tr>
<th>Community</th>
<th>School</th>
<th>Total Enrollment Pre-K through 12th grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>Nunamiut School</td>
<td>110</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>Meade River School</td>
<td>85</td>
</tr>
<tr>
<td>Kaktovik</td>
<td>Harold Kaveolook School</td>
<td>62</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>Nuiqsut Trapper School</td>
<td>153</td>
</tr>
<tr>
<td>Point Lay</td>
<td>Kali School</td>
<td>102</td>
</tr>
<tr>
<td>Point Hope</td>
<td>Tikigaq School</td>
<td>247</td>
</tr>
<tr>
<td>Utqiagvik</td>
<td>Ipalook Elementary School</td>
<td>674</td>
</tr>
<tr>
<td></td>
<td>Hopson Middle School</td>
<td>257</td>
</tr>
<tr>
<td></td>
<td>Barrow High School</td>
<td>232</td>
</tr>
<tr>
<td></td>
<td>Kiita Learning Community</td>
<td>56</td>
</tr>
<tr>
<td>Wainwright</td>
<td>Alak School</td>
<td>167</td>
</tr>
<tr>
<td></td>
<td><strong>Total</strong></td>
<td><strong>2,145</strong></td>
</tr>
</tbody>
</table>

Student Enrollment and Graduation

The school district’s enrollment for the 2016 - 2017 school year (SY) was 2,145 students.\(^{277}\) Between the 1999 – 2000 and 2014 – 2015 school years, enrollments have not changed significantly. There have been similar decreases in the number of students at nearly all grade levels. The decreases were in elementary (13.4 percent), middle (13.7 percent), and high (13 percent) school enrollment. However, pre-kindergarten and kindergarten enrollments have risen Slope-wide by 38 percent and 49 percent, respectively, over the same time period. Even with these gains of enrollment of the youngest students, pre-kindergarten class sizes rose only slightly in Point Lay (Kali School) and Atqasuk (Meade River School). An additional noteworthy change is the decrease in Iñupiat students in high school (-32 percent) and middle school (-22 percent) while there is an increase in elementary school Iñupiat student enrollment (+35 percent). Overall, there are more elementary-age children today than in 2003 (NSB Census year). However, there are fewer middle and high school students.\(^{278}\)

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Based on fiscal data from the 2013 - 2014 SY, the average education expenditures per student in the NSBSD was $39,418; the average student expenditure for the State of Alaska for the same year was $18,466. While the NSBSD spends more per student than the state, the NSBSD graduation rate is much lower, at 48.2 percent and 71.1 percent, respectively. The 2015 NSB Census reported an even lower graduation rate; the proportion of high school graduates climbed from 19.5 percent for the 2002/2003 SY to 24.1 percent for the 2014/2015 SY.

The NSBSD offers an Iñupiaq Language Program that is intended to foster fluency in Iñupiaq. This is a pull-out program where students are offered Iñupiaq language instruction with an Iñupiaq language teacher separate from the general education teacher. Instruction is based on the Accelerated Second Language Acquisition (ASLA) methodology and supported with a customized computer based language-learning tool called the Visual Iñupiaq Language Assessment or VIVA. The NSBSD Iñupiaq Education Department uses the Iñupiaq values, culture, history, language, and worldview as an instructional foundation.

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283 Ibid
In addition to the language program, the Iñupiaq Learning Framework (ILF) provides the foundation for Iñupiaq-based academic curricula and assessment. To further involve students in the culture and history of the North Slope, in 2016 the NSBSD Board of Education updated student graduation requirements to include North Slope Government, North Slope History, and Alaska Studies classes.

Ilisaġvik College

The North Slope Borough is also home to Ilisaġvik College, Alaska’s only Tribal college. The founders of the North Slope Borough were acutely aware of the importance of education to their dreams of sustained self-determination and local control for their people, looking towards the development of a post-secondary educational system that would allow residents to further their educational goals while remaining close to the culture and lifestyle that sustained them.

In 1986, the North Slope Borough created the North Slope Higher Education Center, a cooperative effort between the North Slope Borough and the University of Alaska Fairbanks. The North Slope Higher Education Center’s Board and the North Slope Borough Assembly changed the institution’s name to Arctic Sivunmun Ilisaġvik College in 1991 to reflect its transformation into a community college. Arctic Sivunmun Ilisaġvik College merged with the NSB Mayor’s Workforce Development Program in 1993, adding facilities and resources to support the growing number of vocational education opportunities available at the college. In 1995, the North Slope Borough established by ordinance the Ilisaġvik College Corporation, an independent, public, non-profit corporation with full power for governance of the college vested in the Board of Trustees. Ilisaġvik achieved accreditation from the Northwest Commission on Colleges and Universities in 2003 and is authorized by the Alaska Commission on

Postsecondary Education to operate in the state of Alaska. In 2005, it also became the first and today remains the only federally recognized tribal college in Alaska.

Iḷisaġvik College provides quality post-secondary academic, vocational, and technical education. Continuing Education Unit (CEU) credits or non-credit are offered for workforce development courses. The college is governed by an eleven-member Board of Trustees that is comprised of one representative from each North Slope community, one at-large member, one NSBSD member, and one member as designated by ASRC.

Iḷisaġvik College serves all the North Slope Borough villages through online classes and in-person classes in Utqiaġvik. The college also has a statewide presence; in 2017, Iḷisaġvik reached 40 communities within Alaska through remote learning instruction. During the 2017-2018 school year, Iḷisaġvik made 91 trips to North Slope communities, ensuring every village on the Slope is served and instated the first four-year degree program, a Bachelors in Business Administration. Iḷisaġvik has 12 full-time faculty members and 20-30 part-time employees. College enrollment is provided in Figure 17.

The cost for a full-time student living off-campus for the 2016-2017 academic year was estimated at $6,870, while the full-time student living on-campus is estimated between $19,000 and $21,400 annually. Through a pilot program kicked-off during the spring 2018 semester, NSB Mayor Harry K. Brower and Iḷisaġvik College President Dr. Pearl Brower announced a tuition waiver for any North Slope resident wishing to enroll in classes at the college. The waiver is available to any Iḷisaġvik program that requires tuition payments, both academic and vocational. In addition to a tuition waiver for North Slope residents, Iḷisaġvik extended the tuition waiver to all qualified Alaska Native students.286

286 Wilhelm, Justina. Executive Director of Institutional Advancement. Iḷisaġvik College. Personal communication.
FUTURE EDUCATION FACILITIES

Over a decade ago, the Ilisaġvik College Board of Trustees directed college leadership and staff to explore options for a new Ilisaġvik College campus. The current facility was built as the Naval Arctic Research Laboratory, now over 70 years of age and was never meant to house a college campus. The current site is host to numerous environmental and logistical concerns; located three miles outside of town, students may be challenged in connecting with the community. The facility that the college is housed in at NARL is over half a century old and requires significant renovations. Its isolated location northwest of Browerville does not allow it to integrate into the community. During severe storm events, the road to NARL can be overtaken by flooding or be washed out, further isolating the college from the community. As such, Ilisaġvik College has assembled a team to bring this project into fruition. The site selected by the Ilisaġvik College Board of Trustees is south of the Samuel Simmonds Memorial Hospital. Because on-site training, internships, and apprenticeships may also be more readily available in the Prudhoe Bay region, developing an educational / training center located in Deadhorse may present new opportunities for North Slope residents. The education center could provide formal instruction while hands-on training could take place in the Prudhoe Bay oilfields. This education model would also be beneficial in that it would embrace a zero-incident safety culture and drug and alcohol free work environment. Partnerships between the NSB and oil and gas industry would be required to make this model a success to meet the region’s future workforce needs with the existing local workforce.

An additional effort to expand educational opportunities on the North Slope is the Residential Learning Center. Students from
North Slope villages will be able to seek educational opportunities in Utqiaġvik. The students will be housed at the former Top of the World Hotel on the corner of Agvik Street and Stevenson Street. In 2013, Pepes North of the Border restaurant was destroyed in a fire. The attached Top of the World Hotel was suffered significant smoke damage and was closed. ASRC, the hotel owner, donated the building for use as the Residential Learning Center. A design to renovate the former hotel has recently been finalized. The improved building will offer 28 dormitory rooms for two students each and two for one student each. It will also have living space for residential advisors, an office, kitchen facility, dining room, and sitting and study areas.

With the growth of national and international awareness and discussion regarding opportunities with Northern shipping and transportation, energy and defense, new facilities are needed to host these conversations about America’s Arctic, in America’s Arctic. The growth of essential infrastructure is necessary to meet the needs of the North Slope, Alaska, and our nation at large.

COMMUNITY INPUT, FINDINGS, NEEDS, AND CHALLENGES

Control of the education system for North Slope youth has come a long way since the founding of the borough and visionary leader Eben Hopson, Sr.’s pivotal speech on the educational needs for the communities of the North Slope. The NSBSD has an Iñupiaq Language Program that is intended to foster fluency in Iñupiaq and uses the Iñupiaq values, culture, history, language, and worldview as an instructional foundation. Recently, North Slope government, North Slope history, and Alaska studies classes have become a graduation requirement. However, graduation rates are still lower than the state average, the number of Iñupiaq language speakers continues to decline, and many parents are concerned about the effect of technology and outside culture on local youth. There have been great strides in improving the local school system overall and fostering a greater appreciation for the local culture, more can be done to improve graduation rates and preparing students for future higher education and employment.

Education issues and concerns identified by workshop participants are provided in Chapter 2 and listed below:

- Borough revenue is not keeping up with cost of capital maintenance or replacement
- There is a lack of interest from community stakeholders and youth in becoming police officers, teachers, pilots, professionals
- Many buildings and other infrastructure need to be updated and renovated due to their age
- Village infrastructure/facility equity
- High teacher turnover
- Lack of a sufficient number of Iñupiaq speaking teachers
- There is not childcare in all the villages
- Ilisaġvik College facility is spread throughout Barrow and is not sufficient for needs
- Lack of respect by youth
Parents need to be proactive and advocate for children and young adults to succeed in school
Create small businesses utilizing training services and loans
The road system will allow greater infrastructure expansion and investment in villages
Establish a regional training center for police and fire protection
Foster police officers, teachers, pilots, and professionals from within the community
Teach traditional knowledge to students
Elders should be more included in school activities
Ensure village equity in education space and training programs
Implement DARE program (Drug Alcohol Resistance Program)
Reinstate the regional leadership team for follow-up and accountability
Technology has taken away youth’s desire to learn culture
Teacher turnover
Loss of language and knowledge
Curriculum mandates from state and federal government
Non-governmental organizations (NGO) are influencing youth

**Findings**

Eben Hopson, Sr. asserted that ‘possibly the greatest significance of home rule is that it enables us to regain control of the education of our children.’

There have recently been substantial increases in younger children enrolled in pre-kindergarten and kindergarten.

The average education expenditures per student in the NSBSD was $39,418; the average student expenditure for the state was $18,466 (FY 2013 - 14).

The North Slope Borough is home to Ilisagvik College, Alaska’s only Tribal college.

Ilisagvik College has long sought a new campus in Utqiagvik or Browerville. The facility that the college is housed in at NARL is over half a century old and requires significant renovations.

Ilisagvik College provides post-secondary academic, vocational, and technical education. Continuing Education Unit credits or non-credit are offered for workforce development courses.

**Needs & Challenges**

NSBSD graduation rates is much lower than the state, at 48.2 percent and 71.1 percent, respectively.

Because on-site training, internships, and apprenticeships may be more readily available in the Prudhoe Bay region than in the villages or Utqiagvik, developing an educational / training center located in Deadhorse may present new opportunities for North Slope residents.

The Ilisagvik College facility is spread throughout Utqiagvik and is not sufficient for needs.
PRIMARY EDUCATION GOAL

Goal Eleven: Increase education and employment opportunities for all residents.

Objective 1: Evaluate educational and training needs of the unemployed.

11.1.1. Determine needs of current and future employers and design education and training programs to target programs to these employment needs.

Objective 2: Develop an areawide education plan for primary, secondary, and higher education with a focus on graduate retention in our communities.

11.2.1. Focus resources on the burgeoning youth population to provide sufficient services.

11.2.2. Maintain and increase coordination between NSBSD and Ilisagvik to offer workforce training programs at the high school level.

11.2.3. Develop internships, apprenticeships, on-the-job training, and student hire programs through NSBSD, NSB, ASNA, ASRC, village corporations, TNHA, industry, and other local and regional agencies and entities.

11.2.4. Continue developing daycare centers in the villages to offer a strong academic foundation through pre-kindergarten education.

11.2.5. Create or strengthen programs to train future teachers from within the community.

11.2.6. Research causes for the high teacher turnover and seek programmatic solutions and funding, if necessary.

11.2.7. Educate parents on the importance of parental involvement in their children’s academic achievements and offer ample opportunities to volunteer in the classroom or assisting outside the classroom.

11.2.8. Assess village training program and education quality equity and adjust as needed.
Objective 3: Evaluate future capital needs to meet educational demand.

11.3.1. Assist Ilisaġvik College in seeking funding to construct a new facility in Utqiagvik to better meet their needs.

11.3.2. Assess village educational space equity and future needs and plan accordingly.

11.3.3. Improve Native language fluency through partial or full immersion programs from pre-kindergarten through high school.

11.3.4. Seek funding and opportunities to assist fluent Iñupiaq speakers to become certified teachers.

11.3.5. Encourage the North Slope Borough School District and educators to further incorporate traditional and cultural values throughout the school curricula.

11.3.6. Integrate Elders into school activities through shared lunches, invitations to speak with classes, and involvement in student projects.

11.3.7. Teach traditional values to new generations by highlighting local success stories and how traditional and cultural values assisted in their success.
Chapter Thirteen
Economy & Economic Development
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The economy is one factor that drives the growth and quality of life in a community. Much of the North Slope Borough’s economy is tied to the oil and gas industry in the greater Prudhoe Bay region. Some borough residents have rotational work in the oilfields or in a position supporting the oil industry, but the greatest contribution to the economy is through tax revenue. The borough assesses property taxes on infrastructure, the primary funding source for the borough’s operations and capital projects.

This chapter discusses the economy of the North Slope as a regional economic unit. Understanding what factors drive regional economic activity can provide insight into future growth opportunities. Population, employment sectors, and unemployment numbers form the basis of an economic analysis.

**Employment**

The majority of workers (61 percent) that live in the North Slope Borough work for the local government, that includes city, Tribal, and the borough, as shown in Figure 18. There are also some state employees that work for the Alaska Department of Health and Human Services and the Alaska Court System, they are not inexplicably not included in the data used for Figure 18. Most of these jobs are in Utqiaġvik, the borough seat of government. A significant portion of residents also work in the education and health fields. In 2016, 10 percent of residents were employed at the North Slope Borough School District, Ilisagvik College, ASNA, or other education or health-related organizations. In Utqiaġvik especially, there is a sector of workers in the tourism industry and support services for science research. These visitors support services in Utqiaġvik that the resident population might not have been able to support on their own.

The Prudhoe Bay region provides many jobs; over 20,000 people committed to the North Slope for oil and gas-related work in 2014.

Official state unemployment figures show the average 2014 unemployment rate was 5.8 percent. However, respondent interview data collected for the 2015 NSB Census indicates that the unemployment rate for NSB residents was significantly higher, at 27.7 percent.

The state estimates the unemployment rate on unemployment insurance claims. However, in the North Slope, there are some issues that might suggest that there are some factors to consider in calculating the unemployment rate. There are not a lot of employment opportunities in the villages; employment benefits end after a period of time; and the abundance of seasonal or temporary workers, especially in the village.
Figure 18: 2016 Resident Worker Characteristics

- Employed in state government: 0%
- Employed in local government: 61%
- Employed in private sector: 39%
- Workers employed all 4 quarters: 66%
- Workers aged 50 and over: 28%
- Residents employed: 71%

291 Alaska Department of Labor and Workforce Development, Research and Analysis Section. September 2016.

Figure 19: 2016 Resident Workers by Industry

- Natural Resources and Mining: 4%
- Construction: 61%
- Manufacturing: 0%
- Trade, Transportation, and Utilities: 2%
- Information: 1%
- Financial Activities: 2%
- Professional and Business Services: 7%
- Educational and Health Services: 10%
- Leisure and Hospitality: 2%
- State Government: 1%
- Local Government: 61%
- Other: 2%

292 Ibid
The State of Alaska Department of Labor and Workforce Development has identified the top occupations for the North Slope highlighting if it is in the Oil and Gas Sector, the Maritime Sector and if it is a TOP JOB. A TOP JOB identifies those occupations with high growth potential, numerous openings, and high wage potential. TOP JOBs are indicated in Table 35.

The State of Alaska, through the Alaska Gasline Development Corporation, is planning to commercialize its North Slope natural gas resources by building the Alaska Liquefied Natural Gas Project, the nation’s largest energy export project. When the project begins, possibly as early as 2019, skilled workers will be needed for a range of occupations. There will be opportunities for Alaskans to fill an estimated 12,000 direct jobs during construction and 1,000 long-term operations jobs once completed.²⁹³

### Table 35: 2016 Top Occupations

<table>
<thead>
<tr>
<th>Occupation</th>
<th>Number of workers</th>
<th>Female</th>
<th>Male</th>
<th>Age 45 and over</th>
<th>Age 50 and over</th>
</tr>
</thead>
<tbody>
<tr>
<td>Janitors and Cleaners, Except Maids and Housekeeping Cleaners</td>
<td>175</td>
<td>43</td>
<td>132</td>
<td>61</td>
<td>51</td>
</tr>
<tr>
<td>Office and Administrative Support Workers, All Other</td>
<td>135</td>
<td>90</td>
<td>45</td>
<td>30</td>
<td>23</td>
</tr>
<tr>
<td>Maintenance and Repair Workers, General</td>
<td>104</td>
<td>13</td>
<td>91</td>
<td>51</td>
<td>41</td>
</tr>
<tr>
<td>Teacher Assistants</td>
<td>102</td>
<td>86</td>
<td>16</td>
<td>40</td>
<td>37</td>
</tr>
<tr>
<td>Secretaries and Administrative Assistants, Except Legal, Medical, and Executive</td>
<td>101</td>
<td>92</td>
<td>9</td>
<td>27</td>
<td>23</td>
</tr>
<tr>
<td>Construction Laborers</td>
<td>88</td>
<td>7</td>
<td>81</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>Executive Secretaries and Executive Administrative Assistants TOP JOB</td>
<td>85</td>
<td>71</td>
<td>14</td>
<td>27</td>
<td>19</td>
</tr>
<tr>
<td>Bookkeeping, Accounting, and Auditing Clerks</td>
<td>81</td>
<td>62</td>
<td>19</td>
<td>27</td>
<td>23</td>
</tr>
<tr>
<td>Water and Wastewater Treatment Plant and System Operators TOP JOB</td>
<td>73</td>
<td>4</td>
<td>69</td>
<td>16</td>
<td>12</td>
</tr>
<tr>
<td>Office Clerks, General</td>
<td>72</td>
<td>60</td>
<td>12</td>
<td>11</td>
<td>9</td>
</tr>
<tr>
<td>Power Plant Operators TOP JOB</td>
<td>68</td>
<td>5</td>
<td>63</td>
<td>24</td>
<td>15</td>
</tr>
<tr>
<td>Laborers and Freight, Stock, and Material Movers, Hand</td>
<td>62</td>
<td>16</td>
<td>46</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>First-Line Supervisors of Office and Administrative Support Workers TOP JOB</td>
<td>60</td>
<td>48</td>
<td>12</td>
<td>22</td>
<td>16</td>
</tr>
<tr>
<td>General and Operations Managers TOP JOB</td>
<td>57</td>
<td>24</td>
<td>33</td>
<td>39</td>
<td>34</td>
</tr>
<tr>
<td>Recreation Workers</td>
<td>56</td>
<td>23</td>
<td>33</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>Stock Clerks and Order Fillers</td>
<td>51</td>
<td>16</td>
<td>35</td>
<td>10</td>
<td>6</td>
</tr>
<tr>
<td>Heavy and Tractor-Trailer Truck Drivers TOP JOB</td>
<td>50</td>
<td>4</td>
<td>46</td>
<td>22</td>
<td>17</td>
</tr>
<tr>
<td>Bus Drivers, School or Special Client</td>
<td>45</td>
<td>21</td>
<td>24</td>
<td>22</td>
<td>15</td>
</tr>
<tr>
<td>Education, Training, and Library Workers, All Other</td>
<td>41</td>
<td>25</td>
<td>16</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Carpenters TOP JOB</td>
<td>39</td>
<td>0</td>
<td>39</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>Cashiers</td>
<td>38</td>
<td>33</td>
<td>5</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Managers, All Other</td>
<td>36</td>
<td>23</td>
<td>13</td>
<td>21</td>
<td>13</td>
</tr>
<tr>
<td>Chief Executives TOP JOB</td>
<td>34</td>
<td>13</td>
<td>21</td>
<td>29</td>
<td>23</td>
</tr>
<tr>
<td>Elementary School Teachers, Except Special Education TOP JOB</td>
<td>34</td>
<td>29</td>
<td>5</td>
<td>16</td>
<td>14</td>
</tr>
<tr>
<td>Maids and Housekeeping Cleaners</td>
<td>32</td>
<td>27</td>
<td>5</td>
<td>10</td>
<td>8</td>
</tr>
</tbody>
</table>

The occupation has been identified as an important occupation involved in the oil and gas industry.

The occupation has been identified as an important occupation involved in the maritime industry.

TOP JOB The occupation is projected to have a high growth rate and numerous openings and has an above average wage.

294 Values in this table represent resident workers only.
COST OF LIVING

An analysis of an economy must identify what it takes to live in a community, such as the cost of food and gasoline, determine the level of comfort an individual maintains. The State of Alaska Department of Commerce, Community, and Economic Development (DCCED) identifies these costs across the state on a quarterly basis.

Table 36 highlights these costs in key Alaska communities, using Utqiagvik to reflect the North Slope Borough as a whole. Utqiagvik, generally, has lower grocery prices than the other North Slope communities because it has jet service to Anchorage and Fairbanks. The costs reflected show that some items can be two to three times higher in Utqiagvik than elsewhere in Alaska. The Alaska Division of Community and Regional Affairs (DCRA) conducts a survey of energy (heating fuel and gasoline) prices around the state biannually. In July 2017, Southeast Alaska had the lowest average gasoline price at $3.72 per gallon, while Utqiagvik had the highest price at $5.90 per gallon. The cost is much higher in the villages. The entire state saw gasoline prices fall between January and July of 2017. Figure 20 illustrates the price of gasoline statewide from 2013 to 2018. There is a general downward trend in price which is a factor that drives oil and gas industry investment in the state.

Table 36: 2017 Community Price Comparison

<table>
<thead>
<tr>
<th></th>
<th>1 Doz. Eggs</th>
<th>1 Gallon Milk</th>
<th>1 Bread Loaf</th>
<th>1 Gallon Gas</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anchorage</td>
<td>$2.79</td>
<td>$3.79</td>
<td>$2.49</td>
<td>$2.65</td>
<td>$11.72</td>
</tr>
<tr>
<td>Juneau</td>
<td>$2.09</td>
<td>$3.89</td>
<td>$1.99</td>
<td>$3.29</td>
<td>$11.26</td>
</tr>
<tr>
<td>Fairbanks</td>
<td>$1.99</td>
<td>$3.79</td>
<td>$2.49</td>
<td>$2.93</td>
<td>$11.20</td>
</tr>
<tr>
<td>Kenai</td>
<td>$1.97</td>
<td>$3.78</td>
<td>$1.68</td>
<td>$2.82</td>
<td>$10.25</td>
</tr>
<tr>
<td>Kodiak</td>
<td>$2.19</td>
<td>$4.09</td>
<td>$2.39</td>
<td>$3.24</td>
<td>$11.91</td>
</tr>
<tr>
<td>Nome</td>
<td>$2.49</td>
<td>$6.29</td>
<td>$2.29</td>
<td>$4.76</td>
<td>$15.83</td>
</tr>
<tr>
<td>Bethel</td>
<td>$3.99</td>
<td>$7.99</td>
<td>$2.79</td>
<td>$4.98</td>
<td>$19.75</td>
</tr>
<tr>
<td>Valdez</td>
<td>$2.09</td>
<td>$3.99</td>
<td>$2.39</td>
<td>$3.24</td>
<td>$11.71</td>
</tr>
<tr>
<td>Glenallen</td>
<td>$5.00</td>
<td>$10.75</td>
<td>$4.95</td>
<td>$5.90</td>
<td>$25.43</td>
</tr>
<tr>
<td><strong>Utqiagvik</strong></td>
<td><strong>$4.99</strong></td>
<td><strong>$5.75</strong></td>
<td><strong>$2.73</strong></td>
<td><strong>$3.70</strong></td>
<td><strong>$14.81</strong></td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td><strong>$2.96</strong></td>
<td><strong>$5.43</strong></td>
<td><strong>$2.73</strong></td>
<td><strong>$3.70</strong></td>
<td><strong>$14.81</strong></td>
</tr>
</tbody>
</table>

ECONOMIC INVESTMENT

In April 2018, the State of Alaska formally designated the North Slope Borough as an “Opportunity Zone” through a federal program designed to drive long-term capital to distressed communities. Created under the federal Tax Cuts and Jobs Act of 2017, the Opportunity Zones Program provides tax incentives to private corporate and individual investors to encourage capital investments in low-income communities. The following considerations were weighed when choosing which eligible communities or portions of communities should be designated “Opportunity Zones”:

- Economic hardship
- Geographic representation
- Project feasibility
- Alignment with existing initiatives
- Community Support

One vital piece missing from the North Slope that involves economic investment is the Alaska Regional Development Organizations (ARDOR) Program. ARDORs are the primary economic development agencies providing support services for their regions, communities, and businesses. The ARDOR program’s mission is to encourage the formation of regional development organizations to prepare and implement regional development strategies. To encourage economic development by leveraging baseline support from the State of Alaska, ARDORs were placed in Alaska Statute 44.33.895. Partnerships are being developed to act as conduits for programs and support services that are customized by the region for optimal success. ARDORs are required to develop and implement regional comprehensive economic development strategies (CEDS) that identify potential assets for economic development initiatives and develop economic profiles for every region and community. Currently there are ten designated ARDORs; there is not one on the North Slope.

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ECONOMIC OPPORTUNITIES

The North Slope Borough has multiple unique and promising economic opportunities in the coming decade; transportation corridors, the Port Authority, community connectivity projects, fiber optic telecommunications infrastructure, and ecotourism.

Transportation Corridors

In March 2018, the North Slope Borough led the construction of approximately 300 miles of snow roads between Utqiagvik, Atqasuk, and the North Slope oil fields that lead to the Dalton Highway as well as from Anaktuvuk Pass to the Dalton Highway. This project provided easier and cheaper winter transportation for North Slope residents to transport vehicles and supplies. It also provides insight into the viability of a permanent road system in the region.

The State of Alaska has recently established a priority project called Alaska Strategic Transportation and Resources (ASTAR). The project focuses on providing connectivity to the villages of the North Slope. The state’s goal is to develop a strategic plan by prioritizing community needs and identifying infrastructure projects which offer the most regional benefits. The project is currently a combination of data gathering including developing field studies and reports; identifying data gaps; and community scoping all in advance of major infrastructure projects. The project aims to both identify regional benefits as well as streamline processes for successful project completion.

Port Authority

A Port Authority for the North Slope Borough was established in 2014. NSBMC §4.01.020 states the purpose of establishing a port authority is “...to plan for, finance, construct, operate and maintain transportation related facilities and activities within the boundaries of the North Slope Borough. These facilities and activities, or Projects, are intended to provide emergency response capability, environmental protection, improved efficiency of local cargo operations, facilitation of resource development, and provision of training and employment opportunities for local residents. These facilities and activities shall be pursuant to the Development Plan.”

The intent is for the Port Authority to create efficient port facilities in ways that are applicable to the coastal communities that will reduce the cost of living for the inhabitants. The ordinance also states that the Port Authority will protect subsistence resources, provide emergency response opportunities, and create local jobs.

Data Storage

Recently, the installation of a high speed internet cable that services the majority of the coastal communities and the expansion of other telecommunication providers providing 4G service, there has been interest in establishing data storage centers. There are two required elements for a location: low cost natural gas and cold temperatures. The demand for new centers increases annually and many companies are looking to the North Slope as the ideal location for a data storage center. The two most viable areas that could host a data storage center are

Utqiagvik and Prudhoe Bay due to their low-cost natural gas.

**OIL AND GAS DEVELOPMENT**

Alaska is an oil state. Oil and gas activities provide abundant state, borough, and individual revenues for persons throughout the State of Alaska and beyond. Prudhoe Bay perhaps the premier oil and gas activity center in the state, with other locations being concentrated around Cook Inlet and adjacent lands.
HISTORY OF NORTH SLOPE OIL EXPLORATION AND DEVELOPMENT

Pre-1800s
Iñupiat residents are aware of oil seepages on Alaska’s north coastal plains

1839
English explorer Thomas Simpson reports oil seepages on the northern coast of Alaska

1823
President Warren G. Harding creates the 23 million-acre Naval Petroleum Reserve No. 4 (PET-4) in Northern Alaska to provide an emergency oil supply for the U.S. Navy

1955
The Alaska Oil and Gas Conservation Committee (now the Alaska Oil and Gas Conservation Commission) is created by the Territory of Alaska

1960
President Dwight D. Eisenhower sets aside the 8.9 million-acre Arctic National Wildlife Refuge for its wildlife, wilderness, recreation, scientific, and cultural values

1964
The State of Alaska holds first lease sale in Prudhoe Bay

1968
The Atlantic Richfield Co. (ARCO) and Humble Oil and Refining Co. (now Exxon Mobil) announce Prudhoe Bay discovery

1969
North Slope oil lease sales net state of Alaska $900 million

1969
Oil companies announce plans to build an 800-mile trans-Alaska pipeline system

1971
President Richard Nixon signs into law the Alaska Native Claims Settlement Act

1969
Congress passes National Environmental Policy Act (NEPA), creating national environmental standards

1970
The Trans-Alaska Pipeline Authorization Act becomes law, effectively halting further environmental lawsuits

1974
Prudhoe Bay to Yukon River road construction is completed

1976
Naval Petroleum Reserve No. 4 is renamed National Petroleum Reserve-Alaska

1976
The Alaska Permanent Fund is written into the state constitution. The fund receives 25 percent of state mineral royalties and other income

1977
TAPS construction is completed for a final cost of $8 billion and a total work force 70,000

1977
ARCO Juneau departs Valdez with first TAPS oil

1980
The Alaska Permanent Fund Corp. is established to formally oversee the permanent fund investments and the legislature appropriates $900 million to the fund

1980
State petroleum revenues triple in a year, 90 percent of $2.5 billion unrestricted general fund

1980
Congress passes Alaska National Interest Lands Conservation Act

1982
Nearly 470,000 Alaskans receive first Permanent Fund Dividend check, $1,000 each

1984
The Barrow Gas Field Transfer Act conveys subsurface estate of the Barrow gas fields and the Walakpa gas discovery site and related support facilities, other lands, interests, and funds to the NSB

1987
Oil prices collapse. State petroleum revenue and general fund are half of previous year

1989
Exxon Valdez runs aground at Bligh Reef, spilling 11 million gallons of oil into Prince William Sound in what is now the second largest oil spill in history

2012
Shell conducts limited exploration in the Chukchi Sea

2015
Shell ends its Alaska exploration and eliminates its costly Outer Continental Shelf operation
NORTH SLOPE BOROUGH PART II | CHAPTER 13: ECONOMY & ECONOMIC DEVELOPMENT

NORTH SLOPE BOROUGH – OIL AND GAS REGULATORY OVERVIEW

Barrow Gas Field Transfer Act of 1984

Through congressional passing of Public Lay 98-366 of the 98th Congress, the Barrow Gas Field Transfer Act of 1984, directed the Secretary of the Interior to convey subsurface estates of the Barrow gas field and Walakpa gas discovery site, related support facilities, funds and other surrounding land interests to the North Slope Borough. This subsurface land transfer, gave the NSB ownership of and authorization for exploration and harvesting of oil and gas within 320 acres of land. Entitlements to energy transportation easements were provided within the Barrow Gas Field Transfer Act, allowing for easements of all purposes associated with the operation, maintenance, development, production, operation or transport of energy (including electricity) from the Barrow gas fields and Walakpa discovery site, to Utqiaġvik, Wainwright and Atqasuk. Right of ways necessary for the NSB to provide energy supplies to North Slope communities were detailed and subsurface right entitlements were modified.299

This Act further conveyed rights, title and interests previously held by the U.S. on sand and gravel beneath UIC lands in the area of the Barrow gas fields and Walakpa discovery site, to UIC. Thus providing additional access and use of area gravel by UIC, for much needed gravel reserves which are vital to any infrastructure development in the North Slope.

Through the enactment of this land transfer, the borough, regional Native Corporation and the local village corporation were provided with an economic engine that would benefit the North Slope.

Leasing and Land Use Activities

Land ownership and fractionation of the surface and subsurface estates throughout the North Slope, makes leasing and oil exploration/production related activities, a lengthy and complex process. Federal, state, borough and at times, native corporation land use regulations and requirements are woven together in a complex network of steps and processes that are to be engaged prior to petroleum development (e.g. exploratory drilling), and associated infrastructure (e.g. ice roads) activity.

Federal - National Petroleum Reserve Alaska and Alaska National Wildlife Reserve

The NPR-A is 22.8 million acre, federally managed land holding within the North Slope Borough. Managed by the Bureau of Land Management, it consists of the largest tract of undisturbed public lands in the U.S., and as of 2010 is estimated to contain 896 million barrels of conventional undiscovered oil and 53 trillion cubic feet of convention, undiscovered natural gas.300

Oil and gas leasing in the NPR-A is authorized under the Naval Petroleum Reserves Production Act of 1976 and as amended. Since 2010, the BLM has held annual oil and gas lease sales at different locations and lease blocks throughout the NPR-A; the most recent lease sale offering to

To date there has only been one exploratory well drilled in ANWR – and it was on private lands. The so called “KIC well”, was successfully drilled by Chevron in the 1980’s on private surface and subsurface estates with its results being a closely guarded secret. Despite this, the USGS’s mean estimates for oil reserves in ANWR state approximately 10.4 billion barrels of recoverable oil are within ANWR’s subsurface estates.

With the ongoing demand for domestic oil and the passage of the Tax Cuts and Jobs Act of 2017, there is renewed national and international oil and gas development interest in ANWR. Through this 2017 Act, the Secretary of the Interior is to “establish and administer a competitive oil and gas program for the leasing, development, production, and transportation of oil and gas in and from the Coastal Plain [1002 Area]” With this legislation effectively lifting the ban on drilling within ANWR, Congress ordered two leases sales in ANWR. The first to occur within four years and the second to occur within seven. Each lease sale is to include at least 400,000 acres. While no specific dates have been provided for the timing of these lease sales, updates of assessments of recoverable oil and natural gas in the 1002 Area is due to be released in 2019.

Before lease sales occur on any federal lands, federal agencies engage in the NEPA process of developing an Environmental Impact Statement. The EIS process includes scoping activities and the development of a scoping report that defines issues that need analysis in the EIS; development of a draft EIS that is issued for public comment;
documentation detailing how received public comment are addressed, development of a final EIS and its publishing along with the lead agencies Record of Decision. For EIS’s developed on oil and gas activities within the North Slope Borough, communities throughout the North Slope, Fairbanks and Anchorage are typically engaged in public scoping meetings. These EIS documents provide the foundational documents for how projects (if approved) are to progress forward and be developed.

State of Alaska
Conducted twice annually by the Division of Oil and Gas (DO&G) of the Alaska Department of Natural Resources; the North Slope, North Slope Foothills, and Beaufort Sea state leases are subject of lease sales in the fall, while Cook Inlet and Alaska Peninsula lease sales are conducted in the spring.\(^{303}\)

Best Interest Findings (BIF) is statutorily mandated for each state lease sale area every 10 years - with calls for new information and public comment periods occurring each year - The BIF evaluates the risks and benefits of oil and gas leasing and informs the public. Areas covered include: wildlife, topographical and geological features, potential impacts of oil and gas development, generally – not specific projects.\(^{304}\) Alaska statutes require the Director of the DO&G to make a written finding of whether or not the lease or license is or is not in the state’s best interest (AS 38.05.035(e). The 10 year BIF for the North Slope\(^{305}\) was issued by the state on April 18, 2018, and encompasses future lease sales of more than 5.1 million acres of state owned land and waters within the NSB, encompassed within 3,137 tracts ranging in size from 640 to 5,760 acres. Five communities are located within this state sale area – Prudhoe Bay, Nuiqsut, Utqiagvik, Anaktuvuk Pass and Kaktovik. Within this 2018 BIF for the North Slope, the state owns the majority of the surface and subsurface lands with ASRC owning subsurface and Kuukpik Native Corporation owning surface lands on the western portion of the Sale area.\(^{306}\)

The most recent fall 2017 state lease sales resulted in $21.2 million in bonus bids; the third larger by dollar since 1998 when areawide lease sales began, netting $110 per acre on average. Bids focused largely in and around the Nanushuk/Torok formations near the Colville River.\(^{307}\)

With nearly 50 percent of the North Slope boundary administered by the State of Alaska currently under lease; there is a shift in focus to management of leased units and getting them to production. The State of Alaska, North Slope Management Plan (NSMP) is a new planning effort to provide a comprehensive land use plan for state lands within the North Slope of Alaska; encompassing approximately 12 million acres. With many competing resources and interests on state lands, this plan is intended to take a holistic approach to sorting and prioritizing competing uses. Such a planning effort has not occurred by state on its North Slope land holding before. The NSMP will guide management decisions for state lands in the planning area for the next 20 years. The plan will also address the

\(^{303}\) Walsh, Chantal. 2018. Oil & Gas Lease Sales. Presentation, Oil and Gas Forum.

\(^{304}\) Ibid


\(^{306}\) Ibid

\(^{307}\) Walsh, Chantal. 2018. Oil & Gas Lease Sales. Presentation, Oil and Gas Forum.
North Slope Borough’s pending municipal entitlement selections.  

North Slope Borough holdings within Prudhoe Bay provide lucrative leasing opportunities to petroleum companies and petroleum service companies supporting the ongoing exploration and development of oil and gas on the North Slope. The NSB owns multiple tracts of land within Deadhorse that are subject to lease agreements and contracts with several different entities (Map 15), providing ongoing annual lease rental revenue for the borough. The NSB also has the ability to tax oil and gas infrastructure within its borders. This revenue allows the borough to build roads, operate schools, and fund for other public services such as health clinics and fire departments.

Map 15: 2015 NSB Deadhorse Lease Tracts

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The NSB’s main revenue source is from oil and gas leasing and activities, and the NSB is committed to ensuring that any leasing and development activity is done in an environmentally and culturally responsive way, with minimal impact to its residents traditional and subsistence way of life. In 2014 the North Slope Borough, Department of Planning & Community Services released its Oil and Gas Technical Report: Planning for Oil and Gas Activities in the National Petroleum Reserve – Alaska. The purpose of this Technical Report was to provide guidance for future oil and gas activities in the NRP-A, which represents approximately 38 percent of the NSB’s land acreage. Additionally, many of the stipulations associated with any land use authorization (LMR authorization) specifically pertain to the protection of the land and the wildlife upon which resident’s subsistence lifestyle is based. The NSB Municipal Code Title 19 details unique land management principles and procedures for development to occur within the NSB’s borders. The NSBMC 19.10.020 code stipulates the purpose of Title 19 is to “achieve the goals and objectives and implement the policies of the NSB Compressive Plan...; and ensure that the future growth and development of the borough is in accord with the values of its residents “among other goals.

Land Use Summary
In 2017, assessments of adjacent state and Native lands, state waters, the Western Beaufort Sea area and the NPR-A resulted in the USGS estimating a mean of 8.7 billion barrels of oil and 25 trillion cubic feet of gas, in place Onshore. Through this same assessment, the Bureau of Ocean Energy Management (BOEM) estimates a mean of undiscovered technically recoverable resources in the Beaufort Sea Outer Continental Shelf Planning Area to be 8.9 billion barrels of oil and 27.7 trillion cubic feet of gas. With these onshore lands wholly contained within the NSB, and the subject federally owned Beaufort Sea Outer Continental Shelf Planning Area, currently accessible only through Prudhoe Bay’s infrastructure, the NSB is poised to receive economic benefit from future oil and gas developments when they occur.

Oil and Gas Issues and Considerations
While current North Slope oil and gas development(s) and those within the foreseeable future do have the potential to bring economic prosperity and benefit to all levels of government, the NSB recognizes that there are issues and considerations that accompany such development. Current activities are shown in Map 16. Some of these issues or considerations are summarized below, but are by no means the only issues which face the borough, its residents or the state.

Oil and Gas Employment
Employment and revenues associated with oil and gas development on the North Slope are cyclical in nature, and are subject to many national and international policies and economic factors.

Jobs in this sector include direct oil and gas industry jobs such as engineers, geologists, drill rig and pipeline operators as well as support
services for which the oil and gas industry in Alaska rely upon (waste management, camp operations, cooks, transportation, construction, etc.).

Announced discoveries such as the Tulimaniq discovery at Smith Bay, the potential opening for exploration of the 1002 Area, and other future opportunities have the potential for significant job growth within the North Slope, with the need for skilled labor. In 2016, with the announcement of the Tulimaniq discovery, Caelus indicated that it had the potential to “play a meaningful role in sustaining the Alaskan oil business over the next three to four decades.” only to reduce its Alaska workforce by 25 percent, due to low prices and fiscal uncertainty in the state. 310

The Alaska LNG project is designed to move Alaska’s North Slope gas to tidewater, with offtake points along the 807-mile pipeline that will provide natural gas for in-state customers. At the pipeline’s terminus in Nikiski, the gas will be liquefied and shipped by sea to Asia. Its construction will create an estimated 12,000 direct jobs with another 1,000 long-term jobs for the operation of the project. The economic impact of this project is also expected to create thousands of indirect jobs. The final agreement on the Alaska LNG project is not expected until the end of 2018. Should final investment decisions be made in 2019, construction could occur between 2019 and 2025, resulting in first in service Cargo shipment occurring in 2024-2025 311

With significant cuts already behind this sector, slowly increasing oil prices, and growing industry optimism, AEDC anticipates employment will stabilize in 2018, remaining at about 2,600 jobs, unchanged from 2017.

- TAPS averaged throughput of 527,323 barrels per day in 2017, the second consecutive year of growth. This volume represents a 1.5 percent increase from 2016, and 3.7 percent over 2015.
- New development on the North Slope bodes well for increasing the volume of oil moving through the pipeline and for generating revenue for state government. It is important to note that production from federal land such as NPR-A does not offer

the same revenue benefits for Alaska as production on state-leased land.

- Oil and gas activity on the North Slope is anticipated to increase in 2018.

- ConocoPhillips plans on first oil from Greater Mooses Tooth #1 in 2018, with additional near-term work planned on Greater Mooses Tooth #2, CD2, and CD5. ConocoPhillips plans to expand CD2 and CD5 with drilling starting in 2020. The company plans to drill five exploratory wells in 2018.

- Hilcorp is finishing construction at its Milne Point’s Moose Pad project with first oil anticipated in 2018.

- Longer-term projects include ConocoPhillips’ Fiord West (20,000 barrels per day) and Willow (100,000 barrels per day) projects and Hilcorp’s Liberty Project (65,000 barrels per day). Oil Search’s Nanushuk project in the Pikka Unit is expected to produce 120,000 barrels per day. Caelus’ Smith Bay also offers long-term potential.

- Eni is drilling in its Nikaitchuq North prospect with additional wells possible, and Glacier Oil and Gas is drilling an exploratory well at Badami. Brooks Range Petroleum, Alliance Exploration, Accumulate Energy Alaska, and other companies are also active planning, exploring, and developing on the North Slope.

- The opening of the Arctic National Wildlife Refuge’s 1002 area and potential for increased access to offshore leases offer the industry additional possibilities for long-term growth.

- Through early 2018, oil was trading at three-year price highs. Short-term forecasts from the Energy Information Agency, Alaska Department of Revenue, and Goldman Sachs indicate oil prices will be higher in 2018 than 2017.\textsuperscript{313}

State of Alaska Department of Labor and Workforce Development offers training and apprenticeship programs.

### Tundra Travel and Access

Access to current and future petroleum developments will be a mixture of all season gravel roads as well as seasonal ice roads and snow trails. The current Prudhoe Bay established infrastructure is accessed by a network of gravel roads that are utilized year round. Mitigation measures such as traffic and access control, speed limits on vehicle travel, dust control and mitigation plans as well as ensuring that area wildlife have the right of way, serve to mitigate the impact that vehicular travel on the Prudhoe Bay road infrastructure has on the surrounding wildlife and environment. New and future developments can and most likely will be accessed only during the winter via ice roads and snow trails. Rollagon (or similar tracked low impact ADNR approved vehicles) are common means for bringing supplies to both industrial development not connected to the existing network, as well as for supplies and exploration activities such as seismic surveys.

Environmental studies, permits and other land use authorizations are required to be obtained prior to any development of year round or seasonal road or tundra travel. Summer impact surveys are required by the state and/or BLM for ice roads, snow trails utilized during winter months, to detail any tundra damage caused as a result of this winter activity. The NSB requires notification of any tundra damage within 24 hours of its occurrence with a written report to be submitted within seven days.

Subsistence Impacts
Rocks, noise, dust, light, vibrations, and increased air and marine traffic associated with petroleum development on the North Slope, have the potential to impact subsistence activities and the subsistence way of life for residents of the NSB. All agencies (federal and state) as well as the NSB have stringent regulations, and stipulations pertaining to subsistence impacts, with the impacts and mitigation required being subject of may EIS’s developed for NSB oil and gas operations. As noted within the recent NSMP, “several important subsistence, sport, and personal uses of fish and wildlife could be affected by [future] state oil and gas lease sale activity. Subsistence activities are important to Alaska Native communities of the North Slope. … Many people maintain strong cultural and spiritual ties to subsistence resources, so disruption of subsistence activities may affect more than just food supplies.”

It was further stated that “mitigation measures addressing harvest interference avoidance, public access, road construction and oil spill prevention can mitigate potentially negative impacts.” Subsistence activities are important to Alaska Native communities of the North Slope. … Many people maintain strong cultural and spiritual ties to subsistence resources, so disruption of subsistence activities may affect more than just food supplies.”

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Dividing of Oil and Gas

Additional tax credit datasets have recently been publicly released to Alaska Geologic Materials Center (Umiat 2D/3D, Puviaq South 3D, Ikpikpuk River 2D, and North Slope 3D). Datasets from two more surveys and 32 wells to be released in November.

ConocoPhillips

Achieved first oil from GMT1 in October; expect peak production of 25,000-30,000 BOPD from Jurassic Alpin C Lookout reservoir.

Planning to drill 4-6 exploration wells in Bear Tooth Unit Willow trend during early 2019.

BLM

Published final Supplemental EIS for GMT2 Rendezvous field development. Preferred alternative is ConocoPhillips’ plan to build 14-acre pad capable of up to 48 wells as a satellite of CRU Alpines Processing Facility.

Great Bear Petroleum

Filed lease plan of operations for Wvn1 exploration well to be drilled east of Horseshoe wells by 88 Energy affiliate Captivate Energy. Partners also include Otto Energy and Red Emperor Ltd.

Brooks Range

Proposing to produce Mustang field using early production facility.

Dividing of Oil and Gas


Caelus

Received approval to expand Nupirut, Kuparuk, and Torok Paks at Ooguruk Unit.

Eni

May resume development drilling at Nikaitchuq Unit this fall. Planning to drill up to three new wells and add laterals to as many as 6 existing single lateral wells at Spy Island.

Hilcorp

Plan to drill 50-70 wells from Moose pad at Milne Point field. Drilling to start late 2018 and first production expected in November. Peak production anticipated to be 16,000 BOPD in 2020 with 30-50 million barrels ultimately recovered.

BP Exploration

2018 POD called for 7 wells in Prudhoe’s Flow Station 2 region. Planning to conduct field-wide 3D seismic survey. Three additional wells possible at Lisburne PA. Planning for major gas sale in accordance with AGDC progress on AKLNG project.

ConocoPhillips

Planning expansion of Eastern NEWS with second phase of development. Expected to come online in 2023. Planning to drill three new wells at KRU Drill Site 2M.

Oil Search


Hilcorp

Plan to drill 50-70 wells from Moose pad at Milne Point field. Drilling to start late 2018 and first production expected in November. Peak production anticipated to be 16,000 BOPD in 2020 with 30-50 million barrels ultimately recovered.

ConocoPhillips

Planning pad expansions at CRU in 2019 to add 10 more well slots at CDS and more slots at CD2 to accommodate 32 wells at Kard. May drill late 2018 CD4-95 exploratory well into Nanuk Nanushuk trend just west of Putu 2 from existing CD4 pad in southern CRU.

Elixir Petroleum

Announced purchase of 35,423 acres in NPRA north of Umiat from Paul Craig.

Division of Oil and Gas

Bid opening for fall lease sales for Beaufort Sea, North Slope, and North Slope Forshis Ainslee sales and three sales of blocks of leases: Gwydyr Bay, Harrison Bay, and Storms scheduled for November 15 at 9 AM. Combining uploaded acreage backed by publicly available information to offer three blocks of leases in fall oil and gas lease sales.

Alaska LNG

Project at de-risk regulatory stage. FERC expects EIS to be finalized in late 2019, allowing for Final Investment Decision in 2020 with project execution completion and first gas in 2024-2025.

BP Exploration

2018 POD called for 7 wells in Prudhoe’s Flow Station 2 region. Planning to conduct field-wide 3D seismic survey. Three additional wells possible at Lisburne PA. Planning for major gas sale in accordance with AGDC progress on AKLNG project.

ConocoPhillips

Planning expansion of Eastern NEWS with second phase of development. Expected to come online in 2023. Planning to drill three new wells at KRU Drill Site 2M.

Oil Search

COMMUNITY INPUT, FINDINGS, NEEDS, AND CHALLENGES

During the public input process, there was little discussion directly related to economic development concerns. However, the lack of employment opportunities coupled with the high cost of living puts a strain on many North Slope households. The remoteness of North Slope communities greatly limits economic development opportunities. Many residents work for local governments – the North Slope Borough, NSBSD, Tribal governments, or Native corporations. Some residents find temporary work on capital projects within their communities - renovating the local school or building roads. ASRC dividends and seasonal employment provide income. Subsistence activities offset the need to purchase expense imported food. Meanwhile, oil and gas development in the Prudhoe Bay region contributes to the regional economy, primarily through tax revenue; few North Slope residents hold positions in the oil and gas industry.

Economic development issues and concerns identified by workshop participants are provided in Chapter 2 and listed below:

- Create small businesses utilizing training services and loans
- Limited free market economy
- Industry population decrease and price of oil
### Findings

The majority of resident employees work for local government: the city, Tribe, or borough. There are also residents that work for the state or federal government or in the education and health fields.

Community price comparisons indicate costs of goods are two to three times higher in Utqiaġvik than elsewhere in Alaska, and higher than that in rural villages.

The State of Alaska formally designated the North Slope Borough as an Opportunity Zone through a federal program designed to drive long-term capital to distressed communities.

The North Slope is not part of the State of Program.

Additional transportation corridors and developing a port would contribute to the North Slope economy.

The Barrow Gas Field Transfer Act of 1984 provides low-cost natural gas to the community of Utqiaġvik.

Recent oil discoveries in Smith Bay and elsewhere as well as expansion of oil and gas exploration and development into ANWR may provide additional economic opportunities and tax revenue.

The most recent fall 2017 state lease sales resulted in $21.2 million in bonus bids; the third larger by dollar since 1998 when areawide lease sales began.

### Needs & Challenges

There are opportunities to develop data storage and other industries on the North Slope.

Developing pipelines from Utqiaġvik to nearby communities of Atqasuk, Point Lay, and Wainwright is consistent with the Barrow Gas Field Transfer Act and would provide a sustainable source of energy.

A balance between current and future development, and traditional and the subsistence way of life is vital for the NSB to move forward in the best interests of its residents.
PRIMARY ECONOMY AND ECONOMY DEVELOPMENT GOAL

Goal Six: Develop strong, resilient local and regional economies.

Objective 1: Encourage collaborative agreements, invest in training, and seek new industries for economic development of the region.

6.1.1. Engage in regional efforts to create a trained local workforce, including collaborative efforts with Iḷisaġvik College, the State of Alaska, and industry.

6.1.2. Investigate the feasibility of establishing an extension of Iḷisaġvik College in Deadhorse to train residents for work in the oil industry.


6.1.4. Research viable industries for the North Slope, such as data storage.

6.1.5. Investigate burgeoning employment opportunities due to improved fiber optic communications.

6.1.6. Develop a North Slope Borough Economic Development Plan to foster new economic development compatible with local values.

6.1.7. Participate in local and regional efforts by Tribal governments, Native corporations, and local governments to prepare economic development plans.

6.1.8. Investigate the potential of mineral extraction by the borough for the benefit of residents.

6.1.9. Continue to invest in creating childcare centers in all North Slope communities to assist working parents.

6.1.10. Assist in entrepreneurs in developing small businesses utilizing training services and loans.
Chapter Fourteen
Health & Safety
CHAPTER 14: HEALTH & SAFETY

HEALTH

Personal Health

Personal health is influenced by many factors. Self-assessment of general health is a national benchmark in the U.S. While about 60 percent of the U.S. population consider themselves to be in “Very Good” or “Excellent” health, two-thirds of the Iñupiat population consider themselves to be in these two categories. Additionally, vast majority of Iñupiat household heads, approximately three-fourths, consider themselves to be in good, very good, or excellent health. Part of the reason for the higher than average self-assessed health level might be due to the fact that the Iñupiat population is much younger than the general U.S. population. Forty percent of the Iñupiat population is seventeen or younger compared to 24 percent of the U.S. population. As expected, increasing age brings higher proportions of “poor/fair” health self-assessments.

Although much of the NSB population assess themselves to be in good health, the July 2012 NSB Baseline Community Health Analysis reported that obesity rates among young children enrolled in the Women, Infant, and Children (WIC) program in the NSB are more than twice the national average of 15 percent. In addition, the obesity rate with NSB school-aged children are roughly 50 percent higher than statewide estimates.

An astounding 53 percent of the Iñupiat population smoke at least some days during the week, this is two and a half times the state of Alaska’s proportion and more than 40 percent more than other Alaska Native populations. Of most concern is the increase in smoking among teens between the ages of 14 and 18. In 2010, 19 percent of this age cohort smoked, at least occasionally, however, by 2015 this proportion had risen to 32 percent.

Compounding issues with the health effects of obesity and smoking, the NSB 2015 Census revealed that ten percent of North Slope Iñupiat households had issues alcohol and/or drug use within their own household. Half of those surveyed noted it was a severe and increasing problem within the community. Among North Slope residents, 34 percent of injuries requiring hospitalization were recorded as alcohol related. And 63 percent of assault injuries were documented to alcohol related (among Alaska Natives).

About 40 percent of NSB household’s heads had difficulty securing healthy foods for their families, and over half of these households cited a lack of subsistence foods as the major problem.

In 2010, about a third of Iñupiat households cited difficulty in obtaining enough food of any kind. Over the next five years, however, this proportion dropped to a quarter. Seventy-one percent of households who stated there were times they did not have enough to eat cited lack of access to store bought foods as the major problem. The high expense of store bought foods as well as a lack of availability in remote communities of the North Slope contributes to the lack of access. Additionally, lack of income, illness, and unemployment are all factors that contributed to a lack of access to store bought food.\(^{318}\)

North Slope Health Service Providers

Health services for North Slope residents are primarily supported by the North Slope Borough Health & Social Services Department and the Arctic Slope Native Association.

The mission of the North Slope Borough Health & Social Services Department is to promote and achieve the overall health and well-being of North Slope residents in a culturally appropriate manner.\(^{319}\) The department’s primary responsibility is to provide health care services to the residents of the North Slope Borough through the following programs: Community Health Aide Program (CHAP), Children & Youth Services (CYS), Integrated Behavioral Health (IBH), Gathering Place, Public Health Nursing, the Senior Program, Veterinary/Public Health, WIC, AWIC, daycare services, sober living, and the Elders and Children Nutrition Program in addition to contracted services of Assisted Living, Mental Health Group Home, Home Makers Program, and Tribal Doctors.\(^{320}\)

The mission of ASNA is to promote the health and well-being of the people of the Arctic Slope, and a vision that the people of the Arctic Slope are healthy and content.\(^{321}\) ASNA regularly coordinates programs and events with the NSB Health and Human Services Department to provide needed services within the communities.

In addition to the programs and services provided by the NSB Health and Human Services Department, the NSB Mayor’s Office manages the Health Communities Initiative. This initiative focuses on promoting healthy lifestyles within each North Slope community. The Healthy Communities Initiative also coordinates and participates in the annual Iñupiat Days event, assists with healthy community youth activities, holds healthy community forums in all villages, works with NSB departments to identify areas in which they can meaningfully participate in these events and activities, and assists with healthy activities for all residents. Examples of specific events held as part of the initiative include Walking Wednesdays and color runs.

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Access to Health Care

Samuel Simmonds Memorial Hospital

Physical health care services for North Slope residents are centered in Utqiaġvik and are primarily operated by ASNA at the new Samuel Simmonds Memorial Hospital (SSMH). ASNA is a not-for-profit organization with accreditation from the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), a non-governmental organization that ensures that member organizations meet quality standards.322

The Indian Health Service (IHS) works with Alaska Native Tribes and Tribal organizations to provide comprehensive health services to Native Alaskans. Samuel Simmonds Memorial Hospital is an IHS-funded, Tribally managed hospital. Control of Samuel Simmonds Memorial Hospital was transferred from the IHS to ASNA in 1986. Personnel from the Alaska Native Medical Center (ANMC) in Anchorage provide specialty clinics at Samuel Simmonds Memorial Hospital. The specialty and tertiary referral location for the Utqiaġvik service area is ANMC in Anchorage.

In September 2013, the new Samuel Simmonds Memorial Hospital officially opened. The 109,000 square foot structure is four times larger than the 1969 facility that it replaced. Samuel Simmonds Memorial Hospital is a licensed 14-bed critical access hospital, also certified as a Level IV Trauma Center. It features:

- 14 outpatient exam rooms;
- 10 single inpatient rooms, including two labor and delivery rooms;
- Four emergency beds;
- Physical therapy;
- Computed tomography (CAT) scan;
- Eye clinic;
- Case management;
- Specialty clinics offering access to specialists by referral;
- “Screening for Life” Breast and Cervical Cancer Screening Program;
- Diabetes education;
- Physical Therapy;
- Optometry;
- Pharmacy; and
- Audiology and endoscopy services.

SSMH also provides specialty outpatient clinics and services:

- Arthritis;
- Audiology;
- Cardiology;
- Diabetes;
- Ear, nose, and throat;
- Gynecology;
- Hepatitis;
- Neurology;
- Ophthalmology;
- Orthopedics;
- Pediatrics;
- Pediatric cardiology;
- Podiatry;
- Surgery; and
- Sleep.

Support services provided by the Hospital include:

- Central sterile supply;
- Medical records;
- Business office;
- Translation services; and
- Morgue.

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ASNA also administers a pre-maternal home at 6196 Herman Street in Utqiagvik. ASNA would prefer that this facility be located adjacent to the hospital in the future.

The NSB Health Department has expressed interest in ASNA taking over the several of its programs: CHAP, Public Health Nursing, and WIC. The Public Health Nursing, WIC and CHAP programs are all located in the Wellness Center in Utqiagvik. Due to their distance from Utqiagvik, primary health care services for the communities of Anaktuvuk Pass and Point Hope are provided by Tanana Chiefs Conference (TCC) (located in Fairbanks) and Maniilaq Association (located in Kotzebue), respectively. Residents of these two villages can also receive health services at Samuel Simmonds Memorial Hospital. Through the comprehensive planning outreach process, residents of Anaktuvuk Pass and Point Hope have expressed dissatisfaction in the administration of health care services by TCC and Maniilaq Association.

Village Health Clinics
Through CHAP, the NSB provides health care services to all North Slope villages, excluding Point Hope. Through a health services agreement, ASNA and NSB CHAP collaborate to manage healthcare delivery. SSMH clinicians provide medical oversight for the frontline care provided by the village health aides (excluding Anaktuvuk Pass and Point Hope). In addition, after initial Alaska Native Tribal Health Consortium (ANTHC) training, ASNA provides orientation, evaluation for certification, and preceptorships (one-on-one shadowing with a provider) for NSB CHAP. Scheduled medical and dental provider visit each village every year (excluding Point Hope and Anaktuvuk Pass).

The NSB employs community health aides and maintains the local village clinic. In Point Hope, the NSB maintains the health clinic facility but the health aides are employed by Maniilaq Association. Staff train with the Alaska Native Tribal Health Consortium (ANTHC), Samuel Simmonds Memorial Hospital, Chief Andrew Isaac Health Center, and with additional organizations as well as through NSB Health Department trainers. CHAP works in partnership with many agencies to ensure services can be provided in the local villages. Local referrals are made for additional assistance with substance abuse, mental health, public health nursing, dental care, eye care, victim assistance, and other supportive services.

There have been difficulties over the years keeping the village health clinic adequately staffed with community health aides. Many are hired from out of the area on a rotational basis. Others are community members. Without sufficient staffing resources, local health aides may feel the stress of providing service for an entire community.

Veterinary Services
The North Slope Borough Health and Social Services Department operates the veterinary clinic in Utqiagvik. Services offered by the veterinary clinic include animal control, pet adoptions, rabies control, animal vaccinations, and limited veterinary services including spaying and neutering and treatment for sick or injured animals. In Utqiagvik, the clinic provide dental services and microchips for animals. Veterinary clinic staff travel to each village two times per year, spring and fall, to provide services for village residents and their pets.
Adult Social Services Programs

Substance Abuse and Treatment

According to the 2012 NSB Baseline Community Health Analysis Report, 6 percent of Iñupiat households reported to “often” be affected by alcohol and drug problems. This is nearly twice as much as other ethnic groups in the North Slope Borough. While this percentage seems low, 61 percent of Utqiagvik households reported the health of the community had “often” been hurt by alcohol and drugs in the past year. The report did not indicate any speculation on the percentage disparities of the household and community impacts indicated by respondents.323

The NSB Health Department currently provides only outpatient substance abuse assessment and treatment services through Integrated Behavioral Health Program at the Matsutani Community Resource Center. IBH also provides referral services to adults and youth who may require inpatient substance abuse services. Together with the NSB Assembly, the Health Department offers treatment scholarships to those who require inpatient services. This scholarship is a one-time opportunity for adults. If a scholarship is offered to a minor, the scholarship can also be offered again in adulthood. Patients are often referred to the Lakeside-Milam’s 28 day residential treatment program in Washington State.

Utqiagvik does not currently have any formal detoxification facility or services available, although residents, health care workers, and local government officials have expressed the desire for a local facility. Utqiagvik residents appearing to require detoxification from alcohol or drugs are taken to the Samuel Simmonds Memorial Hospital for medical monitoring and/or evaluation. Those who do not require a medical evaluation are typically taken to the Utqiagvik Police Department jail if they are a danger to others or themselves.

The Wellness Center once served as an Utqiagvik substance treatment center and detox facility but was closed in 2006 due to the declining North Slope Borough budget. There are no current plans to reopen a substance treatment center and/or detox facility in Utqiagvik. The Alaska Federation of Natives, the largest statewide Native organization in Alaska, is highlighting the importance of substance abuse treatment centers in regional communities to expand the treatment options for Alaska Native individuals and families. Additionally, the NSB Health Department reported a number of concerns with sending those in need of treatment to residential programs out of the Utqiagvik area, such as the one in Washington, because the programs are expensive. The typical 28 day duration is often considered too short a duration to be effective. Additionally, the centers lack a culturally relevance setting. The Health Department supports reinstituting a treatment program in Utqiagvik to serve not only Utqiagvik residents but all North Slope village residents. Over the next twenty years, the NSB Health Department anticipates the need for a thirty-bed facility with fifteen of those reserved for village use.

Assisted Living

In February 2016, ASNA was granted licensure by the State of Alaska to manage the day-to-day operations of Assisted Living facilities.

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operations of the Assisted Living Center in Utqiagvik. The facility was previously managed by Hope Community Resources through a contractual agreement with the North Slope Borough. ASNA renamed the facility, Aimaabvik, which translates to “place you call home” in Iñupiaq. Aimaabvik is a 12-bed facility with 6 shared rooms. The assisted living center offers the following services for their residents:

- Clean and sanitary accommodations;
- Three meals daily, plus snacks, and accepts traditional food donations;
- Help with activities of daily living, which include bathing, toileting and dressing;
- 24-hours supportive care;
- 24-hour nursing telephone support;
- Medication supervision;
- Housekeeping and laundry services;
- Weekly linen changes, or as needed;
- Recreational and meeting space;
- Privacy, including for phone calls;
- Organized recreational, spiritual, and physical activities;
- Program for personal services to enhance residents independent living skills; and
- Referrals to medical and social services when appropriate.324

Independent Living
There is currently a waiting list for the 29-unit Senior Center facility for independent living located at 5452 North Star Street in Utqiagvik. The NSB Health Department believes that there is a current unmet need for an additional 20 units now and an additional 50 units by 2035. The program is administered out of the Wellness Center and is available for all North Slope residents.

Mental Health
Hope Community Resources offers mental health assistance through a facility with six beds. The NSB Health Department believes that there is currently a need for a 20 bed facility, growing to as large as 30 beds by the year 2035. There is also a mental health day program that is administered out of the 12-plex at 5155 Herman Street.

Arctic Women in Crisis
AWIC offers emergency shelter and counseling services for victims of domestic violence and sexual assault. It also provides accommodation for homeless women. The current women’s shelter is located in a 12-plex complex in Browerville. Over the next 20 years, it is possible that a new AWIC facility would be needed. The Health Department indicated that locating a new AWIC facility near the police station would be beneficial to the program and its clients.

Homeless Shelter
Currently there are no homeless shelters on the North Slope. The Native Village of Barrow administers a housing assistance program that places Tribal members in local hotels on a temporary basis. This program is provided through grants from HUD and Native American Housing Assistance and Self Determination Act of 1996 and is only available to federally recognized tribes and housing authorities. The maximum amount of assistance available is $5,000 per year, per person, every other year. On average, NVB assists 20 individuals per year with securing temporary housing. They also maintain a list of “couch surfers.” These are individuals going back and forth between friends and family because they do not have a home. The North Slope Borough provided a $200,000

grant to NVB for assistance in locating a suitable homeless shelter facility.

Pre-Maternal Home
The Pre-Maternal Home, located at 6196 Herman Street, is open for women and children referred by Samuel Simmonds Memorial Hospital. The Pre-Maternal Home serves as a temporary “home away from home” for pregnant women and their children. It is a five-bedroom house with five bathrooms and an office space, full kitchen, washer/dryer, and comfortable living space. Educational classes are held regularly at the home including family gatherings where tenants and parents gather and share the joys and challenges of parenting, share ideas, and allow children to play together. Other classes held include budgeting for families and parental rights.325

The Gathering Place
The Gathering Place is a day program for adults impacted by severe and persistent mental illness. It is located in Browerville and offers counseling services, case management, and assistance with state and local resources.

Children Social Services Programs

Daycare
Residents of the North Slope have long sought daycare services. During the village comprehensive plan process, each North Slope community expressed the need for child care services in their respective communities for all income levels. The North Slope Borough operates the Barrow Early Learning Center. This facility offers daycare services for 20 children, from 6 weeks old through 36 months in out-of-home care. ASNA administers a Tribal Child Care Program. The program exists to provide child care for eligible low-income families who are working, attending job training, or education program, are self-employed, or participating in subsistence activities. The Tribal Child Care Program requirements are aligned with ASNA’s approved plan through the Administration for Children and Families’ Child Care Development Fund (CCDF) Office of Child Care. The program utilizes the Tribal CCDF Guide and Minimum Standards for Tribal Child Care Health and Safety Guide to promote program integrity and accountability.326

There is also a daycare in Nuiqsut that provides service for local children and their families. Other daycare facilities in the remaining villages are needed and may be developed as where possible.

Children and Youth Services
The North Slope Borough Children and Youth Services Division (CYS) in Utqiagvik is operated by the NSB Health Department. The facility provides emergency shelter to children ages 18 years and younger. CYS has a 14 bed facility for displaced children when family or foster placement is not available. Counselors are available to assist children and their families.

The current CYS facility is a Level 2 Emergency Stabilization and Assessment facility. A Level 2 facility provides behavioral rehabilitation services and temporary residential care for children that may be in danger in their current situation, require temporary placement, or an assessment of their needs. The NSB Health Department indicates that CYS could be licensed as a Level 3 Residential Treatment program. The Level 3 designation requires that 24-hour

behavioral rehabilitation treatment for children with emotional and behavioral disorders. CYS takes placements from NVB, the NSB Health Department, and the State of Alaska.

The CYS facility is located at 2000 Ahkovak Street in Utqiaġvik, at the intersection with Okpik Street. Although there will be a need for additional space by 2035, the lot size and configuration limits the ability to expand the facility. CYS is planning to construct a playground on a 3,000 square foot gravel pad extending from the facility’s existing gravel parking lot. The entire playground area will be enclosed by an 8 foot tall privacy fence with a secure gate.

**Foster Care**

By Tribal resolutions, the Native Village of Anaktuvuk Pass, Atqasuk, Kaktovik, Nuiqsut, and Wainwright authorize ASNA to administer and approve the Indian Child Welfare Act Program on their behalf. The services provided include representing Tribal children in court hearings, case reviews, working with families and the state to minimize the removal of tribal children and/or placement of children with their relatives, and handling customary adoptions and outreach services to the villages. Indian Child Welfare Act services for the village of Point Lay are administered through the Iñupiat Community of the Arctic Slope.

**Substance Abuse and Treatment**

Currently there is not a program or facility for substance abuse or treatment for minors. The potential for a substance abuse and treatment facility for minors was addressed in a 2009 draft NSB PAR for a new police station/justice center. The project cost was estimated to be $35 million. The NSB Health Department supports the development of both a program and facility. The Health Department also notes that extremely overcrowded housing is a factor in drug exposure for young children and that juvenile drug use is on the rise.

When minors commit lesser crimes, they may be released to their parents because housing minors with adults at the jail is prohibited. The Health Department has indicated that there is a need for a culturally relevant program that serves minors with substance abuse issues that are involved in criminal activity.

**EMERGENCY SERVICES**

**Police Department**

The NSB Police Department’s primary responsibility is providing police services within the borough. The Department’s headquarters are in Utqiaġvik, as are the jail and 24-hour dispatch center. The Department also has offices, jail facilities, police officers, and community public safety specialist in each of the seven villages and Prudhoe Bay. The typical village police office includes jail cell(s), booking area, office, evidence room, garage, and living quarters.

Emergency 911 calls are handled through NSB Police Department Dispatchers in Utqiaġvik and relayed to the local police officer. Residents can also call a local phone number to report non-emergency incidents to the Police Department.

Arraignments for bail-able offenses are handled telephonically with the Barrow Superior Court.

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For Point Hope residents, these offenses are handled with the Kotzebue Superior Court. More serious offenses, suspects are flown to Utqiaġvik or Kotzebue. In extreme public safety matters, reinforcement personnel are flown from Utqiaġvik to assist village police officers.

Fire Department
The NSB Fire Department responds to fires and other emergencies in all the North Slope communities; its headquarters are in Utqiaġvik. Staff includes medical professionals for critical care air ambulance and medevac services, instruction services provided by Ilisâqvik College, and fire prevention and safety programs for school children.

There are two fire stations in Utqiaġvik and one in each village. Each village fire station has one village fire chief, emergency responders, as well as voluntary emergency responders. The typical village fire station has one tanker, one engine truck, one ambulance, one pick-up truck, and one sport utility vehicle.

All paid staff and volunteers have basic fire training, adult and small child/infant cardiopulmonary resuscitation (CPR) certification, and are certified emergency trauma technicians. The department also provides emergency medical technician certification when instructors and funding are available.

Search & Rescue
The NSB Search and Rescue Department provides medevac, search and rescue, and other emergency services. Staff at Search and Rescue provide airborne response to aero medical (medevac), search and rescue, and other emergency services. The Department currently operates five aircraft, each having a unique function in department. NSB employs one chief pilot, two lead pilots, and 12 additional pilots for flight operation support.

Learjet 31A
- Primary Medevac aircraft for transportation between Utqiaġvik and Anchorage
- Anchorage flight time approximately 1.5 hours
- Can be used for village support with good runway conditions
- Can accommodate 2 patients

Kingair 350ER
- Ideally suited for gravel field landings and long range flight 8+ hours in SAR mode
- Primary village aircraft
- Back up Medevac aircraft for transportation between Utqiaġvik and Anchorage
- Anchorage flight time approximately 2.5 hours
- Can accommodate 2 patients
- Search and Rescue observation platform
- Sikorsky S92
- Primary Search and Rescue helicopter
- 6 hours useful endurance at 130 knots
- Approved for flight into known icing conditions
- Approved for flight in Instrument Meteorological condition
- Infrared camera with separate search and rescue operators station
- Approximately 8000 lb. payload (less required fuel load)
- Capable of supporting all the North Slope villages and requests for help in the Brooks Range
- Configured for one patient
Bell 412 - 2
- Back up SAR helicopter
- Routing community support within 120 nautical miles of Utqiagvik

The NSB Search and Rescue Department also employs a full-time Search and Rescue Coordinator that assists village volunteer search and rescue organizations to effectively prepare for and conduct search and rescue activities in their local community, as well as ensuring effective use of search and rescue equipment. Staff travel to each North Slope community on a quarterly basis to meet and discuss needs.

Risk Management

Among its many duties, the staff at the Risk Management Division of the NSB Administration and Finance Department is responsible for disaster coordination and emergency preparedness and response, such as power outages during severe winter storms. Risk Management stores supplies and equipment for immediate deployment in the case of an emergency.

NATURAL DISASTER PREPAREDNESS

The NSB Risk Management Office coordinates emergency management and disaster coordination, as well as insurance policies, claims management, safety training, and inspections. The NSB Multi-Jurisdictional Hazard Mitigation Plan (Hazard Mitigation Plan) was adopted via resolution in August 2016. This Hazard Mitigation Plan identifies and coordinates risk mitigation efforts with state, federal and local partners, and fulfills the requirements set forth by the Code of Federal Regulations Title 44 “Emergency Management and Assistance,” Part 201 “Mitigation Planning,” subsections 6 and 7 (44 CFR §201.6, §201.7). For each community, the plan provides a review of local hazards, vulnerability assessment, and mitigation strategies. In addition to this Hazard Mitigation Plan, the NSB maintains an Emergency Operations Plan, and Village Preparedness Plans for each community. The Emergency Operations Plan was adopted via resolution in September 2008. The Emergency Operations Plan details response to incidents based on their severity and communicates the responsibilities and activation process of the Incident Management Team.  

CONTAMINATED SITES AND HAZARDOUS WASTE

The Alaska Department of Environmental Conservation maintains an online database of contaminated sites in Alaska. Contaminated sites are defined as “a location where hazardous substances, including petroleum products, have been improperly disposed.” Contaminated sites are designated by ADEC as Open or Cleanup Complete. Cleanup Complete sites may require Institutional Controls, meaning the land use and activity must be maintained by the owner in an ADEC-specified manner to protect human health and the environment. Open sites are where

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remediation is pending and/or characterization of the contamination has not been completed.

Contaminated sites are present in every community within the NSB. Many of these sites are designated by ADEC as Cleanup Complete. For full details regarding contaminated sites within NSB communities, see the community-specific comprehensive plan. Contaminated sites which are not in the purview of a community-specific comprehensive plan include those within SA-10, along the Dalton Highway, at Umiat camp, and places along the Beaufort Sea where resource extraction has historically taken place.

The U.S. Department of Defense (DOD) has used land throughout the United States to both train military personnel and test new weapons. DOD is responsible for the environmental cleanup of properties that were formerly owned by, leased to, or otherwise possessed by the U.S. and under the jurisdiction of the Secretary of Defense prior to October 1986. Such properties are known as Formerly Used Defense Sites (FUDS). On the North Slope, DEW Line sites, NARL, and Umiat are included in the FUDS inventory and also in the ADEC database of contaminated sites. Map 17 illustrates the location of contaminated sites within the borough outside of the communities and Map 18 shows contaminated sites within SA-10.

Hazardous waste ends up on the North Slope of Alaska for many reasons. There are no landfills within the NSB or across the State of Alaska which accept hazardous materials all hazardous materials are eventually shipped out of the state for proper disposal.

**SPILL RESPONSE**

Spill response within the NSB is covered under the NSB’s Emergency Operations Plan. The NSB maintains an Oil Discharge Prevention and Contingency Plan (ODPCP or C-Plan) as required by ADEC for locations which meet the tankage threshold. As a requirement of the NSB’s C-Plan, the NSB has contracted a Primary Response Action Coordinator (PRAC) who is contracted to provide personnel and/or equipment to contain, control, or clean up oil spills and comply with response planning standards. In addition to the C-Plan, NSB maintains a Stormwater Pollution Prevention Plan (SWPPP) for each community, as required by the U.S. Environmental Protection Agency (EPA) tankage thresholds, as well as a U.S. Coast Guard Facility Response Plan for all coastal communities. These plans are reviewed and updated regularly as required by ADEC, the EPA, and USCG.

The North Slope Borough participates in a Mutual Aid Program in partnership with the oil and gas industry. The program includes field testing and training as well as oil spill scenarios to determine response and resource gaps. The exercises are held annually in Prudhoe Bay.
COMMUNITY INPUT, FINDINGS, NEEDS, AND CHALLENGES

Healthcare is a challenge on the North Slope. The villages rely on health clinics and health care aides for routine medical assistance. For more robust medical services, residents must travel to either Samuel Simmonds Memorial Hospital in Utqiaġvik or to Fairbanks / Anchorage or beyond. There are also multiple entities providing health care services, sometimes with similar duplicate programs. Streamlining healthcare services would likely provide improved care overall. There are also safety needs in all communities: search and rescue equipment and facilities in the villages; contamination and hazardous waste clean-up; and adequate spill response.

Health and safety issues and concerns identified by workshop participants are provided in Chapter 2 and listed below:

- Aging health infrastructure
- Shortage of local professional workforce attributed to turnover and burnout
- Lack of homegrown health professionals
- Lack of healthy social activities
- Contradiction between technology and culture
- Lack of daycare centers
- Homelessness
- Food insecurity
- No crisis center for men
- Grants don’t always cover programmatic costs
- There are different local health care providers in Anaktuvuk Pass and Point Hope
- Lack of hospice care
- Consolidating/Combining /collaborating on services amongst organizations
- Promote new programs/services for families and homelessness
- Promote and incentivize preventative programs
- Establish an environmental health division or department to coordinate with industry and residents
- Offer parenting classes
- Employers could promote and incentivize volunteerism
- Expand health care services through telemedicine
- Creation of a health consortium
- Climate change and food security: melting ice cellars, ice pattern changes, changing culture
- Distance between villages and communication system
- Drugs and alcohol: substance abuse and lack of behavioral health and treatment facilities
- Pollutants, including dust
- Unsafe driving practices
• Social media: influence that promotes bullying, constant stimulation, excessive use limits hands-on activities and critical thinking skills
• High Medicaid denial rate
• High rate of cancer

Findings

Health services for North Slope residents are primarily supported by the NSB Health & Social Services Department and ASNA. There are several other entities involved in providing health care services: State of Alaska, Maniilaq, Tanana Chiefs Conference, and the NSB Mayor’s Office.

NSB provides many emergency services, including police, fire, and search and rescue.

There are many contaminated sites across the North Slope that require clean-up. Many were left after military or other federal government operations.

Drug and alcohol use is pervasive across the North Slope.

Needs & Challenges

Training is needed for local residents to be community health aides.

Daycares are needed in nearly every community to allow parents to work during the day.

Villages need additional search and rescue equipment and facilities.

All communities seek additional recreational facilities and programs for healthy living and social connectivity.

Consolidating health services and programs will reduce duplicity and streamline services.

The growing elderly population will require additional services, such as senior housing and programs that assist with meal preparation and transportation.
PRIMARY HEALTH AND SAFETY GOALS

Goal Ten: Protect our environment.

Objective 2: Identify, remediate, and remove contamination and hazardous waste.

10.2.1. Identify existing and abandoned sites with garbage, hazardous waste, and toxic substances and seek funds for demolition and clean-up.

10.2.2. Educate village residents about proper disposal of garbage, hazardous waste, and toxic substances.

10.2.3. Enforce existing laws and policies to prevent future contamination.

10.2.4. Develop a system for the export of hazardous and other non-disposable material.

Goal Twelve: Improve and consolidate social services.

Objective 1: Foster a healthy lifestyle for all residents.

12.1.1. Seek increased access to recreational facilities in the villages, especially at the schools, to promote physical activity.

12.1.2. Continue to encourage healthy living and fitness through the Healthy Communities Initiative and other programs.

12.1.3. Collaborate with local Tribes, city governments, and corporations to offer entertainment and activities, such as movie nights, sports, and clubs.

12.1.4. Continue to provide treatment assistance for those with addiction issues.

12.1.5. Educate residents on the importance of fitness and a well-balanced diet for longevity and overall quality of health.
Objective 2: Evaluate existing programs and seek improvements and consolidation where possible.

12.2.1. Investigate the feasibility and potential cost savings of consolidating health and social services offered by Health Department and ASNA.

12.2.2. Evaluate ways to train homegrown health professionals and address current turnover and burnout.

12.2.3. Promote and incentivize preventative programs.

12.2.4. Establish an environmental health division or department to coordinate with industry and residents.

12.2.5. Seek improved coordination of care with local health care providers in Anaktuvuk Pass and Point Hope.

12.2.6. Promote and incentivize volunteerism.

12.2.7. Expand health care services through telemedicine.

12.2.8. Creation of a health consortium.

12.2.9. Evaluate current programs aimed and preventing and treating drug and alcohol abuse for effectiveness and implementation of best practices.

12.2.10. Provide education on the effective of cyber bullying and constant stimulation of technology.

Objective 3: Evaluate capital needs to accommodate program improvements.

12.3.1. Seek funding for a regional detoxification facility.

12.3.2. Seek funds for a hospice facility.

12.3.3. Evaluate the need for a crisis center for men and the space needs for Arctic Women in Crisis.

12.3.4. Establish a regional training center for police and fire protection.
12.3.5. Coordinate with local search and rescue organizations to identify and facilitate facility space needs.

12.3.6. Evaluate the need for renovations and expansion of health clinics.

Objective 4: Evaluate needs of elderly population.

12.4.1. Focus resources on providing for the aging population as this group increases.

12.4.2. Create a hospice care program in all the villages.
Chapter Fifteen
Land Use & Land Management
CHAPTER 15: LAND USE & LAND MANAGEMENT

The North Slope has a myriad of landowners, land managers, and land rights at all levels of government. There are some factors that are consistent across the entire North Slope, such as Alaska Native Claims Settlement Act, NSB land use and subdivision regulations, and the need to coordinate amongst many of different land managers and landowners.

Two very significant land issues that have remained unresolved for decades both relate to lands being returned or conveyed to the residents. The first is ANCSA related, and the second deals with Municipal Entitlements and other ways to acquire land for the borough.

LAND USE BACKGROUND

ANCSA, enacted into law on December 18, 1971, was intended to settle outstanding Alaska Native land claims and establish clear title to Alaska’s land and resources.

ANCSA established 12 Alaska Native regional corporations (with a 13th regional corporation created later for Alaska Natives not residing in Alaska), and over 200 local village corporations. The Act established regional and village corporations with village corporations receiving title to the surface estate in and around their respective village(s), and regional corporations retaining subsurface (mineral) estate rights on selected lands. Section 14(c)(3) of ANCSA provides that the village corporation shall convey to a municipal corporation (city) or the state in trust (where an incorporated city does not exist), lands identified for present and future community needs.

There are two types of protected (restricted) land for Native Alaskans: Native Allotments and Restricted Townsite lots.

Restricted land is inalienable; the property owner cannot lease, sell or convey the land, or any inherited interest in the land, without first obtaining approval from the BIA. Generally, restricted land is also not subject to state or local laws, including taxation and land use regulations, such as zoning. Native restricted land will remain tax-exempt unless changed by the United States Congress or the restrictions are removed with expressed approval by the BIA.

Restricted lots were generally distributed via two federal statutes: the Alaska Native Allotment Act of 1906 and the 1926 Alaska Native Townsite Act. The Alaska Native Allotment Act of 1906 authorized the Secretary of the Interior to grant individual Alaska Natives ownership of up to 160

acres of “vacant, unappropriated, and unreserved non-mineral” land. The majority of Native allotments are near villages and along rivers, streams, lakes, and coastal waters. There are 725 Native allotments within the North Slope, most of which are located near the villages of Point Hope, Wainwright, Point Lay, Atqasuk, Utqiagvik, and Nuiqsut. Of the 725 Native allotments, only 130 of those are near the communities of Anaktuvuk Pass and Kaktovik. In 1971, one of the ANCSA provisions repealed the authority to grant Native allotments, with an exception of those applications that had already been submitted prior to December 18, 1971. The Alaska Native Vietnam Veterans Allotment Act of 1998, however, allowed qualifying Alaska Native Vietnam-era veterans who were on active duty in August 5, 1964 through May 7, 1975, to file an allotment claim under the 1906 Allotment Act even though it had been repealed in 1971.

As of July 2017, there were still approximately 272 pending applications for Native allotment land. Certificates for 255 allotments have been issued, and seven parcels remain pending.

The 1926 Alaska Native Townsite Act was passed by the United States Congress for the purpose of conveying public lands to Native Alaskans for homes within villages. All Townsite Act designations were repealed by the passage of the Federal Land Use Policy and Management Act (FLPMA) in 1976 however lots that were already designed as ‘Native restricted’ under the Townsite Act did not lose their status. Restricted deeds are managed for Native land owners by the federal government. The owners’ ability to sell or transfer the property is limited, but since federal law limits state and municipal jurisdiction over land uses on property held in trust by the U.S. government, restricted lots are not subject to NSB land use regulations nor are they subject to property tax. There are approximately 533 restricted lots within the North Slope Borough, most of which are in the villages of Point Hope and Utqiagvik.

Unlike other forms of property which are subject to the probate jurisdiction of state or Tribal courts, Native restricted property is completely within the U.S. Interior Department’s jurisdiction. Because some restricted landowners do not always have wills that specify beneficiaries, heirs in common inherit the land, often for several generations. Some property may have multiple owners and with each passing generation, the portions of property interest become smaller and smaller, causing the property to become fractionalized. Even without probate issues, it may be difficult to reach a consensus amongst multiple property owners, a status which jeopardizes a property’s usefulness.

Native restricted land can become unrestricted. Once the restricted status is removed, the land can be taxed and sold without BIA approval or oversight. For example, if a restricted property is

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sold or willed to a non-Native, it will be conveyed to that person in an unrestricted status. Natives that chose to will a restricted property to a non-Native can opt to leave it as a life estate. The non-Native heir would use the property during his or her lifetime and when he/she passes away, the property is transferred to the second choice named in the owner’s will, thus potentially returning it to restricted status.339

Designated Native restricted property, can represent land use concerns for the NSB or surrounding parties. For example, if a structure on a restricted property becomes a safety hazard for the community, local land use regulations cannot require that property owners mitigate the property to remove the risk.

**Municipal Land Entitlement**

The intent of the State of Alaska’s Municipal Entitlement program is stated in AS 29.65.129, “Consistent with the best interest of the state, it is the policy of the state to provide a newly formed municipality with a general grant land entitlement that is no less than 10 percent of vacant, unappropriated, unreserved land located within its boundaries. It is the policy of the state to provide for expeditious transfer and patent of land to a municipality in fulfilling its entitlement.”

At the time of the borough’s first selections, the Municipal Land Entitlement Act (originally AS 29.18.190, now AS 29.65.010) entitled the borough to select up to 10 percent of the state’s general grant lands within the borough’s borders. That would have been approximately 700,000 acres. The borough’s initial selection (May 29, 1973, ADL 64646) was for a little more than 367 acres and included 25 of the 75 Deadhorse lease tracts. The selection was rejected, and the borough appealed unsuccessfully in *North Slope Borough v. LeResche*.340

The mid-1970s through the early 1980s saw the development of Deadhorse or Service Area 10 and the borough’s utility operations and the construction of the Kuparuk Industrial Center (KIC). This development was essential to support oil production, which peaked in 1988.

The state recognized the importance of these developments in its 2002 decision to reclassify and convey the two parcels upon which SA 10 Camp and Utility were located.341 The decision described the state’s obligation to grant these parcels is:

> All of the industrial lease tracts are a source of revenue to the state; however, the state has an obligation to fulfill the municipal entitlement given to the borough under AS 29.65.010. The purpose of the municipal entitlement is to create a source of revenue generation for qualifying municipalities. . . The economic benefit to the NSB is that it will have a land base as a whole from which to stimulate community development and economic growth within the borough.

DNR’s 2005 and 2006 decisions likewise included reclassification of previously classified land for conveyance to the borough. Additional DNR commissioner decisions that support reclassification and conveyance of state lands include the 1997 Cross Island decision, the 2002

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341 See the July 9, 2002 Final Finding & Decision on ADLs 414783 and 417199: Deadhorse Lease Tracts.
decision regarding SA-10 parcels in Deadhorse, the 2007 Chukchi barrier islands decision, and the final decision from December 2011 for various tracts in Prudhoe Bay and Kupararx areas.

**Consistency**

As stated in *LeResche* and many other cases in Alaska and U.S. jurisprudence, the standard of review for an agency’s action on matters committed to agency discretion is limited to whether the decision was arbitrary, unreasonable or an abuse of discretion. Inconsistent decisions may be considered arbitrary.

DNR stated at the January 28, 1999 NSB Planning Commission meeting that it agreed with AOGA’s position that lands classified "Resource Management" prior to September 1, 1983 were not conveyable. This statement appears to be a reversal from its earlier statements made on December 2, 1996 and August 6, 1998.

The position that Prudhoe Bay lands cannot be reclassified is also inconsistent with DNR’s analysis in the Preliminary Decision that Tracts A and B of ASLS 85-48, on which the Kuparuk Industrial Center sits, is appropriate for reclassification and conveyance under the Municipal Entitlement Act. If some lands may be reclassified and reconveyed, then it would be arbitrary for DNR to find that “[n]o reclassification can operate to make [Prudhoe Bay] lands available for selection by the borough.”

DNR has reclassified and conveyed lands (including Resource Management lands classified prior to 1983) to both the Denali Borough and the City of Valdez. Refusal to convey Resource Management lands to the North Slope Borough would be inconsistent.

**State and Borough Best Interests**

Not only is it in the public interest to reclassify parcels already classified for oil and gas development so that they can be used for a variety of purposes by the borough, the borough’s interest in obtaining these parcels outweighs the state’s interest in retaining them. The following analysis of these interests applies to all of the requested parcels.

The borough has developed land management ordinances for fair and predictable management of tracts and materials currently under its ownership. The borough offers competitive land management options and competitive

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342 North Slope Borough v. LeResche. 581 P.2d at 1115n11 (siting numerous cases).
344 Preliminary Decision at 25.
345 Brady Letter at p. 7.
346 E.g. ADL 415464 (640 acres to the Denali Borough); CL 916 (City of Valdez); ADL 225441 (505 acres, 12/15/1997); ADL 225451 (1,075 acres, 12/15/1997); ADL 229099 (180 acres, 3/11/05).
347 Under NSBMC 2.38.170, all borough lands not needed for, or devoted to, a public use, may be leased or sold, when the sale or lease would be in the best interest of the public. Under NSBMC 2.38.180, sales and leases are open to any adult citizen or permanent resident of the U.S. and any entity authorized to conduct business under the laws of Alaska or the United States of America, unless that person has failed to make payment in relation to borough land in the previous five years, or the person is currently (or has been within the past five years) in breach or default on any contract or lease involving land in which the borough has an interest, or the borough has other good cause to believe that the person is unlikely to make payment or responsibly perform under the lease or other contract. Under NSBMC 2.38.250, a lease for more than four years is subject to a rental adjustment at intervals of no more than four years unless the lease specifies longer intervals. When not otherwise specified by the terms of the lease, all rental adjustments are for the appraised fair market rental value of the premises. NSBMC 2.38.270 allows the Mayor to negotiate a land lease without a public offering (but with the approval of the Assembly) if the lease is for property at fair annual rental value for a term not exceeding ten years; or the lease is for a beneficial new industry, subject to the terms of this chapter; or the lease if for a public purpose, to a governmental agency or not-for-profit corporation formed for the purpose of carrying on the public service.
access to material sites to support that development – both for the oil and gas industry itself and the support industries that dominate Deadhorse. New development is already happening on borough-owned tracts in Deadhorse where development previously did not exist. A number of developers testified to the borough’s land and gravel management ability at the July 8, 2009 hearing, including Joe Nukapigak (Kuukpik Corporation), Sam Brice, T.J. Bourdon (ICE Services), and Cindy Bailey (BP).

Service Area 10 is an example of the borough’s management abilities. The borough established Service Area 10 to provide quality refuse collection and disposal services, water service, and sewer service to industrial users in the Prudhoe Bay/Deadhorse and Kuparuk areas; to protect the investments of the North Slope borough through prudent management and sound fiscal policies; to provide employment for residents of the North Slope Borough; and provide services in a manner which is safe for employees and the environment; and to provide a point of contact for state and federal agencies, oil and gas industries and other major companies doing business in the area.

Market values of land in the Deadhorse area have increased since the borough took ownership of land parcels and commenced lease auctions. A 2003 appraisal stated that demand for industrial land in the North Slope Industrial Tracts held by the state was low, although there was significant room for development. The appraisal suggested that a change in demand was unlikely unless new discovery or construction of a natural gas pipeline occurred.

A 2009 appraisal by the same assessor told a different story. With DNR’s and NSB’s competitive lease activity, subleases of North Slope lease tract parcels became more prevalent. Demand for industrial land in the North Slope lease tracts increased while supply declined.

There are vast resources of gravel in the North Slope’s floodplains, river deltas, and riverbanks. In Prudhoe Bay, gravel mines occupy the entire floodplain of the Put River. Over 5,200 acres of the Sagavanirktok River were mined for the Trans-Alaska Pipeline, including in the river channel itself. New mines are still being bulldozed in river flood plains. Mining recently took place in the Kuparuk River floodplain for the Northstar oil field and in East Badami Creek floodplains for the Badami field. A mine is proposed in floodplains of the Kadleroshilik River for the Liberty offshore oil field.

The borough has requested a limited number of sites that are gravel sources. The borough would

348 MacSwain Associates LLC. Chapter 5: Self-Contained Appraisal Report (draft) Nuiqsut Natural Gas Pipeline Right-of-Way. ADL 416202, Valuation Date October 1, 2003
350 Ibid
351 Ibid
benefit from the use of gravel for its capital improvement projects, as well as the revenue that gravel sales provide. The borough is in a good position to manage the sites, as it already has infrastructure and personnel in close proximity.\(^{356}\)

Gravel is critical to the operations and maintenance of the oil fields and the maintenance and construction of new infrastructure. Thirty-six gravel mines have been excavated for the oil fields and transportation on the North Slope. Twenty-four mines have been excavated for the oil fields\(^{357}\) totaling at least 6,364 acres of river and tundra sources combined.\(^{358}\) Another 12 gravel mines are in use for the Trans-Alaska Pipeline and Haul Road (Dalton Highway) with the North Slope\(^{359}\). The borough has no intention of managing gravel in a way that would interfere with oil field development (on which the borough also depends for tax revenue).\(^{360}\)

The southern half of the PUT 23 mine site was conveyed to the borough in 2011 and is currently operated through an agreement with BP and is a significant source of gravel material in the central Prudhoe Bay area. Mine Site F, also conveyed in 2011, is in the final steps of being permitted as a new material site in the far western area of the Kuparuk River Unit and is likely to be an important source of material for the development of the Nanushuk project. Mine Site 3, also conveyed in 2011, is also in the final permitting phases with the U.S. Corps of Engineers to provide material for Dalton Highway maintenance and to also fill the need for gravel in the Deadhorse area as PUT 23 resources decline. Material sales are currently already in place for PUT 23, and the borough expects a contract soon for Mine Site F.

**Developments beyond Oil and Gas**

It is unrealistic to categorize the entire area around Deadhorse for oil and gas development. Even if every parcel were capable of producing oil, some parcels would still need to be devoted to developments that support the oil and gas industry. Thus, parcels should be analyzed individually to determine their highest and best use.

The borough is aware, just as the state must be, that oil and gas reserves in the Deadhorse area will eventually be exhausted. Other industries, particularly the service industry, are and will be essential in this area to support eastern and western field expansions.

**Lack of Alternatives**

The borough’s interest in the lands around Deadhorse becomes more apparent when the lack of alternative selections is considered. DNR recognized this in its 2005 Preliminary Determination, finding that the state-owned land available for selection on the North Slope “includes vast amounts of inaccessible land located many miles south of the developed area

\(^{354}\) Currently, the state does not have a record of the location and volumes of gravel that it has available for sale, nor is an accounting of the volumes of gravel that have already been mined and/or committed for sale.

\(^{355}\) National Research Council, 2003 p.65

\(^{356}\) National Research Council. 2003, p. 12; State of Alaska DNR, North Slope Material Sales contracts pit information (March 28, 2001), Fairbanks; US Army Corps of Engineers, (June 24, 1997), Colville River 17 Permit (4-960869) to Nuiqsut Constructors [Alpine Gravel Pit].


\(^{358}\) NSBMC 2.38.280 allows the borough to make gravel on Borough lands available for the purposes of development. Sales must be at fair market prices.
of Prudhoe Bay, and mostly south of approximately Pump Station 2. This land has no near-term development potential, except and unless gas fields are found in the North Slope Foothills . . . There is some acreage of selectable land along the Dalton Highway, but much of this is not suitable for any form of economic development. The borough has selected most of the land along the Dalton Highway that is suitable and available. Virtually the only other selectable acreage that is potentially valuable for borough ownership is the Deadhorse lease tracts that are a part of this decision.\textsuperscript{361}

The state’s granting of municipal land entitlements is essential in fulfilling the constitutional provisions for maximum local self-government.\textsuperscript{362} Conveyance of the borough’s requested lands and material sites will allow the borough to manage lands that are vital to the well-being of its residents.

State Benefits of Conveyance

The state has limited resources to devote to monitoring North Slope development activities. Conveyance of lands to the borough would reduce the state’s administrative and oversight burdens, and allow the state to concentrate on other priorities. Furthermore, the state will gain a partner in attracting development to the Slope—not just a competitor. The borough has a strong track record of facilitating onshore and nearshore oil and gas developments. Borough ownership of some of the land on which development takes place would in no way complicate the state’s permitting and management of these developments.

The borough appreciates DNR’s consideration of its requested selections and of these comments. To date, DNR has conveyed a little over 12,000 acres of the borough’s 89,850 acres entitlement. The borough has increased development on the land already conveyed and will continue to facilitate development and good management of its lands and resources. It is in the public interest for the borough’s requested selections to be reclassified and conveyed to the borough.

### North Slope Management Plan Scoping Comments

The role of state land use plans was established by state statute (AS 38.04.005). It is the policy of the State of Alaska “…to establish a balanced combination of land available for both public and private purposes. The choice of land best suited for public and private use shall be determined through the inventory, planning, and classification processes…”

The plan determines management intent, land-use designations, and management guidelines that apply to all state lands in the planning area. The borough’s interest in this process is not just related to how the state will manage its land, but also how the state will provide for the satisfaction of municipal land selections by the borough and how the borough will coordinate its management efforts. Changing the old way of thinking is necessary to produce a long term management plan that will accommodate the borough’s interests and form a framework for resolving conflicting ideas about land use.

\textsuperscript{361} See 2005 Preliminary Decision at pp. 14-15.

\textsuperscript{362} See AK Const. Art. X (providing for maximum local self-government with a minimum of local government units (Sec. 1); taxing powers (Sec. 2); service areas (Sec. 5), and home rule (Sec. 11); AS 38.05.910: “It is the policy of the state to encourage the settlement of its land and the development of its resources by making them available for maximum use \textit{consistent with the public interest} . . . (emphasis added).”
Although no area plan has been developed for this area, land that was owned by the federal government has been conveyed to Native organizations and the State of Alaska over the last 20 years. Several areas of federal land interest have not yet been resolved, but should be considered as part of this planning process. Land that was assumed to be state land is now either owned by the borough or by Native organizations. Assumptions about how land will be managed are now more complex issues, but not one that should be assumed to be more difficult or unwieldy to manage. Memorandums of Understanding have become a tool to better coordinate land management and permitting. The originally estimated area of oil and gas development and its ultimate life span have both increased substantially, as have the number of interested parties. Management of the oil and gas units has diversified beyond a very limited number of large companies to now include smaller and midsized companies that are not owners of the primary transportation infrastructure.

Issues that aren’t going away soon – gravel needs, wetland mitigation, subsistence impacts, utility needs.

A major consideration is the changing population and geographic range of the various caribou herds on the North Slope. There is a need to incorporate the latest information about each of the herds in the area plan and include guidance for authorizations issues by the Department that pertain to concentration areas and movement corridors.

The interest in oil and gas development, both onshore and offshore has quickened during the last decade, and will continue despite short term reductions in the price of oil. Areas that were not considered for development are now the subject of new projects. With this renewed activity comes the need to revise the old way of thinking. Aging infrastructure also should compel the parties to this process to think differently about how services are provided to support the oil and gas industry and where they will be located. The oil industry must reduce their cost of operating the fields that provide such a substantial source of revenue to the State of Alaska and the North Slope Borough. The borough must also improve communication and service needs to address this change in business model.

The plan is meant to establish land use designations for state land and describe their intended uses. The area of significant interest to the borough is how these designations will direct land use and its availability to satisfy municipal entitlements and also best serve the residents that rely on the land and the lease holders who operate the oil and gas fields that support the local economy. Although some proposed uses might be in conflict with each other, many different used can occur through the planning area while protecting vital resources, provided that the uses are properly managed.

General management guidelines for major resources and land uses with the planning area as well as guidelines for the development and use of resources for specific parcels must be a combined effort of the state and the borough. The residents of the North Slope Borough will remain here when the oil and gas are gone and must be prepared to co-manage the resources along the way.

Improving the permitting and permit review process should always be a shared goal. The area plan should guide both state and local
decisions for leases, sales, and permits to use the lands in the planning area and the adjoining areas outside of the scope of this project that will rely on the infrastructure and transportation modes that exist or are reasonably foreseeable.

Near Shore State Waters
Two critical areas of the Beaufort Sea have been traditionally considered off-limits for oil and gas leasing – the Utqiagvik area and the Kaktovik area associated with whaling activity. Additional areas in the mid-Beaufort near Cross Island have also had seasonal activity restrictions. Will these areas continue to maintain protection for the benefit of subsistence users as a more permanent planning effort, or will they continue to be subject to best interest findings?

A similar area exists in the Chukchi Sea related to walrus haul outs. This is outside of the North Slope Area Plan, but was not clearly identified in the Northwest Area Plan. The thought process behind these selections is as follows:

- Currently conveyed/selected land areas are expanded in order to provide for expanded utilization of these areas for economic development.

- Previously conveyed sites have already passed the LeResche tests for the borough’s interests exceeding the states.

- Reclassification, when necessary, has already been accomplished by formal finding of the state.

- Additional new areas were selected based on previous uses as development nodes and/or material sites. The proposed selections support a plan to define five basic development nodes within the borough’s boundary along the Dalton Highway – Deadhorse, Franklin Bluffs, Happy Valley, Pump 3/Material Site 119-4, and Galbraith. Two general development nodes are proposed along the Spur Road in the KIC area and near the Colville River (either north or south of the Alpine Pipeline). The interagency land management agreements (ILMA) at many of these locations should be part of a discussion with DNR and DOT&PF in order to clearly identify the necessary land area for their purposes and minimize the size in order to more efficiently facilitate shared use.

- Material sites have already been disturbed, and consistent with Title 19, should be maximized prior to opening new sites to satisfy gravel demands both along the Dalton Highway and within the oil fields. The general material sites areas include combinations of submerged lands and upland gravel sources. The borough realizes that submerged sources are not conveyable. Rather, the borough’s goal is to “zone” such development consistent with Title 19, regardless of the agency that may own or operate the site. Seven generalized areas for concentrating material site development are also identified.

- Known lease areas related to guide hunting have also been selected.

- The NSB is not interested in owning or maintaining the additional airports/airstrips, but does feel that these development nodes are the most efficient
locations to centralizing services. Maintenance, fuel storage, utility provision, temporary lay down or camp space to support all users can be more efficient by planning ahead and coordinating efforts.

- Additional selections related to protection of subsistence activity areas has been minimized due to the previously successful selection and conveyance of similar sites by the regional and village corporations.

All of the North Slope Borough communities are surrounded by federal lands managed by different agencies with different purposes. This does not provide an opportunity for the borough or its communities to expand, increase economic development or physically connect to their neighbors or the state transportation system. Some of the lands that are eventually reclassified and conveyed by the state should be considered for land exchange with the federal government. Consideration should be made for exchanging certain lands that borough acquires with federal and private landowners for the purpose of creating economic opportunity, developing resource potential, identifying necessary transportation support corridors, development nodes and utility sites that also support industrial activity and also protect critical historical and subsistence locations.

For the purpose of long term planning and land use, the borough has attempted to cluster development nodes consistent with the original Dalton Highway Master Plan and the NSB Comprehensive Plan. Grouping such development into these areas minimizes the long term impact on the Dalton Highway corridor. Similarly, consolidating planned regional material sites into more discrete areas also accomplishes this goal.

Additional selections will be necessary to ultimately satisfy the full entitlement. The borough’s original entitlement was 89,850 acres. The next step was to finalize the next group of borough selections for consideration. The Land Selection Group recommended addressing the following parcels (roughly 23,000 acres) in 2014

- Nuiqsut (414826) – 10,240 acres
- Beaufort Islands Groups (East, Middle & West) (414854, 414853, 414852) – approximately 6,600 acres
- Thetis Island (414857) – 118 acres
- Pump 2 (414836) – 2,299 acres
- Happy Valley (414838) – 2,917 acres
- Franklin Bluffs (414835) – 830 acres
- Pt. Thompson (414827) – 320 acres

The Beaufort Islands and Nuiqsut parcels were controversial. The Dalton Highway parcels will require more work and cooperation with DNR, DOT&PF and industry and were further delayed.

The preliminary decision on these priorities was to completely reject all requests. The borough appealed the decision and the Commissioner suspended the preliminary decision with the commitment to complete a North Slope Management Plan that would finally address on an area-wide basis what had been required to complete for the site-specific plans of the few selections that had been resolved.

- A new Land selection process will be needed when the North Slope Management Plan is completed.
- It has been almost twenty five years since the North Slope Borough has worked with its communities and the Planning Commission to review, prioritize and select
lands for consideration by the State of Alaska for conveyance.

• The last process involved senior staff reviewing priorities for selection. In parallel, the Planning Department led the effort to engage local residents in identifying areas of key subsistence value and other resource value.

• It is time to review the lands that have been selected and conveyed to date and reevaluate local priorities. The records of the public meetings in the late 1980’s are scattered, so it is difficult to assess the reasoning behind all of the selected areas. Formation of a review committee with instructions to document, collect public input, and reprioritize should be high on or list of tasks to complete.

• Over 85 percent of the North Slope Borough’s land selections have not been adjudicated. Thousands of acres have been adjudicated in the process of conveying the lands that the borough has received. These deductions leave the borough underselected in total; the borough needs to re-evaluate what has been selected, ensure that it meets long term needs, and submit additional selections. After that process, the borough anticipates reengaging DNR to evaluate the highest priorities through a new adjudication process.

• Areas that are of economic value, have gravel potential, and are appropriate locations for development nodes/utility locations are very important. Also important are areas that provide for protection of traditional travel routes and subsistence access.

• Additional lands may also be selected for the purpose of exchange with the federal government in areas that the borough could not select entitlement land.

ZONING AND LAND USE REGULATION

One of the primary ways to implement a comprehensive plan is through land development regulations. Zoning districts identify how land can be used and often establish development regulations. Subdivision regulations are developed by the NSB to promote safe usage and occupancy by the residents of the NSB, provide future growth and development opportunity, and mitigate against environmental impact (e.g. coastal erosion etc.) by development activities; while protecting and maintaining the social, cultural and economic stability of the borough. A subdivision is a tract or parcel of land for the use (immediate of future), sale, financing, lease, development or transfer of any interest in real property.

A major component of local planning is zoning, the division of areas into land use districts and the regulation of lands within those districts. Zones are designed to accommodate current and potential uses. Detailed regulations guide how each district can be used. The NSB is charged

with administering platting and zoning on behalf of residents.

The NSB has created zoning districts for all land within its jurisdiction, public and private. There are currently nine distinct land use planning zones within the NSB. The vast majority of the NSB is zoned for conservation purposes.

Official zoning maps are maintained by the NSB. The NSB Planning Commission can recommend modifications to these official mapped zoning boundaries, with decision making authorization on zoning boundaries only assigned to the NSB Assembly. The official rezoning process is detailed in NSBMC §19.60.060 where any rezoning application requires a public engagement process with the surrounding community(ies), to take into consideration the wishes of area residents.

Maps 19 and 20 are official NSB zoning maps for the Resource Development District and Utqiagvik. The entirety of the North Slope’s seven rural villages are within the Village Zoning District.

Table 37: Zoning Districts

<table>
<thead>
<tr>
<th>Zoning District</th>
<th>Area (square miles)</th>
<th>Percent</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barrow Industrial and Storage (I)</td>
<td>2.3</td>
<td>0.003%</td>
<td>This District is for aviation, shipping, storage, and warehousing of materials and goods in bulk that are not compatible with residential and commercial uses. Uses often include loading docks, terminals, storage sheds, and accessory offices (Map 20).</td>
</tr>
<tr>
<td>Barrow Mixed Use (MU)</td>
<td>0.75</td>
<td>0.001%</td>
<td>This is a residential and general use area, reflecting the traditional settlement pattern of the older sections of the borough’s communities and is characterized by a mix of residential, commercial, and other uses. Uses should enhance economic opportunities but not intrude into residential areas with unnecessary congestion, noise, or environmental impacts (Map 20).</td>
</tr>
<tr>
<td>Barrow Reserve (R)</td>
<td>17</td>
<td>0.019%</td>
<td>This District provides protection of environmental resources, especially watersheds, and local subsistence and recreational opportunities. It is also an area which requires infrastructure such as roads, sewer, water, and power before development (Map 20).</td>
</tr>
<tr>
<td>Barrow Suburban Residential (S)</td>
<td>0.8</td>
<td>0.001%</td>
<td>This is a low density quiet residential area that encourages traditional Iñupiat settlement pattern of individual family home sites with single-family homes on large lots and ample storage area for vehicles, boats and subsistence equipment (Map 20).</td>
</tr>
<tr>
<td>Conservation (C)</td>
<td>87,205</td>
<td>96.029%</td>
<td>This District encompasses the undeveloped areas of the borough and is intended to conserve the natural ecosystem. It can accommodate resource exploration and development on a limited scale, but major resource development projects must apply for rezoning to the Resource Development District classification.</td>
</tr>
<tr>
<td>Zoning District</td>
<td>Area (square miles)</td>
<td>Percent</td>
<td>Description</td>
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</tr>
<tr>
<td>Resource Development (RD)</td>
<td>1,600</td>
<td>1.762%</td>
<td>This District addresses large scale resource extraction and related activities as well as offers developers quick, inexpensive, predictable permit approvals for master planned developments that do not impair the capacity of the surrounding ecosystem to support the plants and animals upon which borough residents depend for subsistence. RD Districts are primarily focused around the oil and gas fields of the Prudhoe Bay area (Map 19).</td>
</tr>
<tr>
<td>Scientific Research (SR)</td>
<td>140</td>
<td>0.154%</td>
<td>This district is elective; it may only be requested by the landowner or an authorized agent. It is used exclusively for scientific research and the support facilities to conserve areas that have scientific research value or have been used for scientific research. These areas should accommodate subsistence use. An example of this zoning district is the Barrow Environmental Observatory (BEO) (Map 20).</td>
</tr>
<tr>
<td>Transportation Corridor (TC)</td>
<td>1,745</td>
<td>1.922%</td>
<td>The TC District is for linear transportation facilities such as roads and pipelines along with development nodes for public and commercial facilities and services. Development should accommodate industrial, commercial recreation, and visitor industry development and enhance economic opportunities for borough residents.</td>
</tr>
<tr>
<td>Village (V)</td>
<td>100</td>
<td>0.110%</td>
<td>The V District governs the city limits of each incorporated village and the sites and immediate environs of unincorporated villages in the borough. This District as detailed in NSBMC § 19.40.060 allows uses that are consistent with traditional values and lifestyles; are in accordance with borough plans; and are consistent with the desires of the village residents. Each village within the borough (with the exception of Utqiagvik) is zones as a Village District.</td>
</tr>
</tbody>
</table>
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The NSB’s subdivision ordinances are codified in the NSB Municipal Code Title 18. The NSB through Municipal Code §18.04 has jurisdictional oversight of any action within its jurisdictional boundaries, including federal, state, public and private lands (except as otherwise stated by law) involving the subdivision of land. This includes the development, improvement, and new openings of streets, utilities and pipelines. Subdivision regulations enable the NSB to plan the specific amount of land in a variety of locations for different types of development and economic growth that it predicts will be needed in the future. There are two different categories of subdivisions: minor and major subdivisions.

- A minor subdivision is a division which: creates six or fewer lots, none of which is larger than one acre in size, will not deny access to and from all lots or tracts created by the or those adjacent to the subdivision and requires no public installation or extension of existing public utilities.

- A major subdivision is all other subdivisions not designated as ‘minor’ and which require variances and/or vacations.\(^{364}\)

Subdivision requests or proposals throughout the NSB are subject to the NSB Platting Administrator’s and NSB Planning Commissions’ oversight.

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**NSB PLANNING**

The NSB Department of Planning and Community Services oversees proposed development and land use applications in accordance with NSB zoning and subdivision requirements. Its mission is to protect the land and cultural resources of the NSB by creating a department that established means to protect the land and wildlife resources within the borough, regulates and monitors development, manages borough owned real estate, plans for future growth and enhances community sustainability.\(^{365}\) NSBMC Title 19: Zoning requires land use permits for all development and uses within the NSB boundaries out to three nautical miles (nm) offshore.

To ensure the protection of the NSB’s cultural history, archeological clearances or cultural resources studies are commonly required to occur on all proposed development(s).

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**Impact Minimization**

Responsible and balanced development requires industry and government to employ the best practicable technologies and planning methods. The NSB encourages the use of technologies such as low emission drill rigs, especially near population centers and directional drilling. Additionally, government and industry must fund scientific research to advance industrial technologies and learn more about the effects of natural resource development on the arctic environment and subsistence activities. Utilizing these technologies and funding technological

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\(^{364}\) A vacation is the act of making legally void any right-of-way, easement, public area, other public interests or any part of a recorded subdivision.

advancements will greatly reduce the impacts of development.

Planning efforts must include the consultation and collaboration with the North Slope Borough, Alaska Native organizations, local communities, and subsistence users. Industry must fully comply with the borough’s permitting process. Planning efforts should also incorporate and utilize traditional Inupiat knowledge. In some cases, it may be necessary for industry to employ subsistence representatives to monitor operations. Moreover, proper planning includes the identification and preservation of traditional land use sites and other areas of archaeological, historical and cultural importance. Proper planning further requires development to occur at a manageable pace, allowing adequate time and opportunity for comments, consultation and mitigation. Rushing development can result in less economic and less environmentally friendly determinations. Therefore, industry should work with the North Slope Borough and others to ensure that decisions are well informed and sensitive areas are protected.

The planning process must involve pre-development information gathering and analysis to ensure that decision makers are well informed. This data gathering must include the predicted impacts to subsistence hunting, the health of residents, wildlife and air and water quality. Collecting baseline data is also necessary to assess the cumulative effects of development over time. Areas critical to subsistence hunting and wildlife populations, such as Teshekpuk Lake and Hanna Shoal, as well as buffer zones for traditional subsistence whaling, should be excluded from leasing and development plans. Industry, researchers, and others should adopt of conflict avoidance agreements with subsistence user groups. In the past, such agreements successfully brought together developers and subsistence whalers to mitigate impacts to subsistence whaling activities. The borough hopes that the conflict avoidance agreement model will be expanded to include other subsistence resources, such as caribou and other marine mammals.

Effective planning also necessitates developers to work together to consolidate their facilities and operations to reduce their overall footprint. Industry should share facilities, pipelines, roads, ice roads and other infrastructure whenever possible. Accordingly, industry and others should limit air and ground traffic and consolidate transportation to and from worksites to minimize disturbances to wildlife, emissions of dust and limit impacts to tundra. Industry must also be conscious of the effects of air traffic on wildlife, particularly walrus and caribou, and implement adequate flight restrictions to address these issues. Industry should also monitor and mitigate the effects on housing prices, airfare and the availability of flights due to influx of workers.

To minimize impacts to human health and air quality, industry should monitor air emissions and harmful chemical constituents at the right times and locations and publically release any data that may inform human health impacts. In some cases, industry will need to set up permanent or mobile monitoring centers, and in consultation with communities may adopt higher emissions standards near population centers. For example, traffic and engine idling can and should be minimized in or near residential areas. In summary, consolidating facilities and operations and monitoring emissions and industry effects on local prices will go a long way to minimize the impacts of development to the local communities.
Lastly, to minimize impacts, industry must engage in dismantlement, removal, and remediation (DR&R). DR&R requires industry to dismantle and remove facilities and equipment that will no longer be used and engage in land rehabilitation. DR&R includes the safe and responsible disposal of all wastes, decommission of old infrastructure, cleanup of legacy wells, rehabilitation of pads, mine sites, oil spill sites and tundra. In some circumstances, developers should be mandated to post bonds to assure DR&R. Furthermore, to ensure safety of residents and wildlife, industry should take soil and water samples near old industrial sites. If levels of contamination violate local, state or federal standards or are of public concern, industry needs to remediate the contaminated soil and water. Monitoring of contaminated areas may be necessary during and after this process. The federal government also has considerable responsibilities in this domain, as many old military sites still require remediation. Thus, to minimize impacts industry must engage in DR&R by removing old infrastructure, rehabilitating land and monitoring contaminated areas.

**Build Up Local Communities and Infrastructure**

Developers should partner with local communities, businesses, and native organizations to promote local employment, training and educational opportunities. This involves hiring North Slope residents and contracting with native corporations and local businesses in all aspects of development, including operations, maintenance of infrastructure, utility services and local spill response. To further this objective, industry should coordinate with the North Slope Borough and Iḷisaġvik College to offer specialized training for residents. Additionally, local institutions should have more authority over the management of wildlife resources on the North Slope. Thus, regulators should work with the North Slope Borough and tribal organizations in operations and to co-manage wildlife populations, similar to the Alaska Eskimo Whaling Commission.

To build up local infrastructure, more operations and support facilities, including airports, docks, roads, pads and other production related facilities should be located near communities. This will allow more opportunities for local employment and will increase local capabilities, such as emergency response. These actions will help share the rewards of development and make local communities intrinsically invested in the success and careful planning of such operations. Another positive potential effect of development is that it opens up the possibility to provide natural gas to residents. Natural gas is a relatively environmentally friendly and affordable energy source, very abundant on the North Slope, which should be expanded to more of the local communities. Therefore, locating operations and facilities near North Slope communities will result in increased employment and improved services and capabilities throughout the North Slope.

In the outer continental shelf, state and local governments currently have very little to gain from natural resource exploration and development and bear all the direct risks, only benefitting if industry happens to locate facilities onshore. To resolve this problem, the borough supports the development and implementation of a revenue sharing mechanism that allows state and local communities to share in the profits of offshore development. Furthermore, the borough encourages the transportation of oil
produced offshore via subsea pipelines to shore-based facilities. Subsea pipelines are a safer means of transporting oil than barging. Revenue sharing and pipelines to shore based facilities would help mitigate the impacts from offshore development and bring the North Slope Borough into a position where communities could benefit from offshore development.

Oil Spill Prevention and Response
Responsible and balanced development requires government and industry to give great emphasis to spill prevention and response. Spill prevention is critical in the arctic, as spill response is likely to achieve only partial success in remote areas in the arctic. Effective spill prevention includes ample personnel, training and expertise, frequent drills and inspections, effective government and industry regulation and oversight, up to date usable spill response plans, improving ice management capabilities and requiring compulsory pilotage of vessels in the outer continental shelf. Spill prevention also includes the use of corrosion and leak detection monitoring systems, secondary containment for storage tanks and subsea pipelines to shore for offshore projects. Regulations and oversight in the outer continental shelf must be strict and rigorous, as data gaps are large and the arctic marine environment is subject to significant disruption and harm from poorly managed oil and gas activities. Effective spill prevention and response also necessitates government and industry to invest aggressively in oil spill response capabilities. Industry and government should collaborate in developing new and more efficient and safe drilling technologies. Summarily, effective spill prevention requires ample personnel and resources, strict regulation and oversight, and improved technologies.

Effective spill response requires authorities to be capable of effectively and rapidly responding to spills and other disasters. This requires ample personnel and training, rapid response capability, strategic and positioning of equipment and Coast Guard presence. Personnel must be located on the North Slope for initial response, with other personnel able to arrive onsite within 48 hours. Effective spill response also requires communities to be quickly notified of disasters in a transparent manner. Moreover, as offshore exploration and development continues, it may become necessary to position well capping equipment, and other spill response equipment, on the North Slope to ensure that this equipment is available for immediate well control without significant delay.

As commercial vessel traffic and offshore development ramps up, there are increasing concerns of oil spills and other accidents in arctic marine waters. Increased needs for navigation aid placement, vessel traffic management, ship compliance inspections, security considerations and emergency response capability clearly suggest that enhanced federal safety infrastructure and maritime resources need to be committed to this region. For these reasons, the government should establish a year round Coast Guard station and resources, including icebreakers in the arctic.

Furthermore, the borough insists that response capabilities are confirmed through rigorous and realistic testing under a broad range of foreseeable arctic conditions. Industry should demonstrate that it has the ability to retrieve spilled oil in broken or refreezing ice conditions during transitional periods in spring and autumn. Allowing offshore development to occur without such a demonstration means that the borough is accepting substantial risk without any assurance
that industry and government can properly respond to a spill in Arctic waters. It is unacceptable to further pursue offshore development in the arctic outer continental shelf absent such a demonstration.

Archeological Clearance and Cultural Resources
Projects that utilize federal funding or involve federal authorization requires a cultural resources survey and clearance. Projects in areas with known cultural resources also require clearance. The NSB Planning and Community Resources Department also often requires cultural resource clearance from the NSB Iñupiat History, Language, and Culture Department before issuing some permits. The potential need for a cultural resources survey should be considered during the early stages of project development.

The databases of cultural resources sites does not necessarily contain all or even most sites. Many areas of the North Slope have not been surveyed. Additionally, not all sites found in academic or earlier federal agency surveys have been entered into the Alaska Heritage Resources Survey (AHRS). Also, many oil company surveys have been kept confidential, which in some cases seems to have included not reporting sites. Some projects which did not go forward never submitted reports to the State Historic Preservation Office (SHPO) and did not tell the archaeologist so that site forms could be sent separately. Since graves are not always eligible for inclusion on the National Register of Historic Places (NRHP), some have not had site forms done to add them to the AHRS.  

Village Planning
Comprehensive plans guide decisions affecting land use and the revisions of NSB land use regulation, transportation, fire protection, public facilities and economy. Each community within the NSB has stand-alone Village Comprehensive Plans that support and complement the NSB’s Areawide Comprehensive Plan. The Planning Commission reviews the village comprehensive plans every two years to ensure that the information and direction is up-to-date.

Land Ownership
The NSB owns property in every village that is used to provide services to the community. NSB land ownership includes the school tracts, teacher housing, housing, utility tracts for public utilities (fuel tank farm, storage, sewage lagoon, power plant, water treatment plant, wastewater treatment plant, etc.). The borough also has easements throughout the communities for access to water and sewer infrastructure. While the different percentages of land owned within the communities jurisdictions varies; the main landowner within all communities is associated with roads, native patents and federal agencies. The nature of each community being “land-locked” by federally owned and managed lands creates an inability for the communities to expand. At some point, options for land swap with the federal agencies needs to be considered for village expansion and also for other economic development opportunities.

ANCSA
Landownership within each community is ever evolving, in part due to ANCSA Section 14(c)(3). This section not only established village corporations, but also identified that village

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366 Jensen, Anne. Senior Scientist. UIC Science. Personal communication.
corporations shall convey to a municipal corporation (city), or the state in trust, lands identified for present and future community needs. Only lands selected and conveyed by patent of interim conveyance to the subject village corporation are subject to the 14(c) conveyance provision. Under ANCSA, a municipal corporation is entitled to 1,280 acres. However, in 1981 ANILCA modified this entitlement acreage to ‘not less than 1,280 acres’ unless the village corporation and the municipal corporation (city) (or the state in trust), agree in writing on a different amount that is less than 1,280. Most 14(c)(3) conveyances are between zero and 1,280 acres. Lands subject of re-conveyance are defined under ANCSA 14(c)(3) to include:

*“title to the remaining surface estate of the improved land on which the Native Village is located and as much additional land as is necessary for community expansion, appropriate rights of way for public use and other foreseeable community needed.”*

Section 14(c)(1) further enables conveyances from village corporations to any Native or non-Native occupant of surface estate tract occupied as of December 18, 1971. Section 14(c)(2) enables the conveyance of occupied surface estate occupied by non-profit organizations, as of December 18, 1971.

The acreage (or percentage thereof) to be conveyed to the different municipal corporations (cities) from the individual village corporations are in varying stages of completion. However the re-conveyance process is the same for all communities (Figure 21).

The North Slope Borough’s municipal land / general grant land entitlement is 89,850 acres as stipulated under AS 29.65.010: Determination of Entitlement of Boroughs and Unified Municipalities. General grant land entitlements are property rights that vest on the date on incorporation of the municipality. The State of Alaska has approved 13,020 acres for conveyance to the NSB through several Final Finding and Decisions (1997, 2002, 2006, 2007, 2010). Approximately 77,000 acres of entitlement remains. The North Slope Management Plan update will classify state lands in the planning area, to allow for the borough to select lands to fulfill their remaining...
entitlement. This process may also convey lands to the borough that could be used to exchange for other lands within the Federal Reserve areas.

As enacted by Section 12 of ANCSA, each community within the North Slope established Native village corporations and selected lands to be owned by that corporation. Combined with the regional corporation, ASRC, over 4 million acres of land rights were conveyed to the regional and eight village corporations. Within each community, land ownership is a mixture of NSB, individual Native village corporation, various federal agencies, municipal, and Tribal.

Community Land Ownership Overview

In 1959, the City of Anaktuvuk Pass was originally incorporated as a fourth class. The Native village corporation for the community is the Nunamiut Corporation with ownership of approximately 92,000 acres of surface lands in and around the community of Anaktuvuk Pass. Other landowners within and surrounding Anaktuvuk Pass include the NSB, the federal government, the City of Anaktuvuk Pass, and others.

Atqasuk’s village Native corporation, the Atqasuk Corporation, owns approximately 73,000 acres of surface lands in and around the community. Other landowners within the community include the NSB and the City of Atqasuk, among others. The City of Atqasuk was incorporated in 1982 as a second class city. The primary landowner for areas outside of the city boundary is the federal government, administered by BLM. Atqasuk is surrounded on all side by the NPR-A. There are a number of Native allotments exist along the banks of the Meade River adjacent to Atqasuk. The community of Atqasuk, as well as its recognized surrounding Area of Influence consists of 30,000 acres and is solely contained within the NPR-A.

The Kaktovik Iñupiat Corporation (KIC), is the village Native Corporation for Kaktovik. The City of Kaktovik was incorporated in 1971 as a second class city. The city limits of Kaktovik encompass roughly 0.8 square miles and land and 0.2 square miles of water. KIC is entitled to receive 92.2 acres within the city limits of Kaktovik and beyond, including an additional 5,207 acres of land within ANWR boundary, per patent number 50-77-0046. As with other Native village corporations, additional land selections are in the process of being approved for conveyance by BLM to the community. The NSB is a large landowner within the community of Kaktovik; it owns the school, health clinic, fire station, air field, power plant, water and wastewater treatment plant, landfill, and Public Works buildings. Other large landownership entities include federal agencies including the USAF, NOAA, and BLM.

The village Native corporation for Nuiqsut is the Kuukpik Corporation which owns approximately 146,000 acres of surface lands in and around the community, including surface lands of the Alpine oil field. The City of Nuiqsut’s boundary encompass 9.2 square miles of land. The City of

Nuiqsut was incorporated in 1975 as a second class city. Federal and state lands are the predominant ownership entities beyond the cities jurisdictional boundaries. The majority of lands selected for conveyance have been transferred to the Kuukpik Corporation. Approximately 2,041 acres are remaining to be conveyed from the BLM.

Tikigaq Corporation, the village Native corporation established under ANCSA, is the primary landowner in the Point Hope area. Tikigaq Corporation has selected and received 3,165 acres under ANCSA, in and around the community that include the old and new village sites. Approximately 227.1 acres are remaining to be conveyed before Tikigaq Corporation receives its full ANCSA land entitlement. The City of Point Hope was incorporated in 1966 as a second class city. The NSB is landowner of several tracts in the community, namely the school, landfill, health clinic, and fuel tank farm. The borough also has easements throughout the community for water and sewer infrastructure.

The village Native corporation established under ANCSA for the community of Point Lay is the Cully Corporation. The Cully Corporation, a primary landowner in the area, has selected and received 90,000 acres of surface lands under ANCSA in and around the community. As with the other communities, the NSB land ownership within the village of Point Lay is on lands used to provide services to the community, such as the school, teacher housing, and utility tracts for public utilities. The community of Point Lay is not an incorporated city.

The Ukpeaġvik Iñupiat Corporation is the village Native Corporation for Utqiaġvik. UIC owns 212,000 acres of surface land rights within the Utqiaġvik area, including 7,400 acres that were set aside in 1992 for scientific research. This area is the Barrow Environmental Observatory (BEO). The City of Utqiaġvik was incorporated in 1958 as a second class city and later as a first class city. Other landowners within Utqiaġvik include ASRC, the Native Village of Barrow, and NSB, and federal agencies. Approximately 13,743 acres is contained within the village boundary of Utqiaġvik and UIC is the primary landowner. UIC has selected and received approximately 175,620 acres in fulfillment of its ANCSA entitlement. The corporation can select an additional 7,177 acres to receive its full entitlement. Several federal agencies own lands within or in proximity to Utqiaġvik. These include: U.S. Air Force, U.S. Navy, NOAA, BLM, and the U.S. Geological Society (USGS), among others.

Wainwright’s village Native corporation is the Olgoonik Corporation (OC), which owns surface estate to over 175,000 acres of land surrounding Wainwright. ASRC owns the subsurface estate to over 160,000 acres of land beneath OC’s surface estate.

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LAND MANAGEMENT PLANS & SPECIAL AREAS

Within the boundary of the North Slope Borough, there are several federal and state jurisdictional land management plans and designated Special Areas. Land management plans are developed as a way forward for regulatory agencies to manage the needs of the competing uses on the land subject to each management plan. Land use planning is a way of sorting through to options for federal and state land use, and with involvement from the public, detailing a multi-year plan for land use and activities.

Many of the federal land management plans for the North Slope region include:
- Gates of the Arctic National Park & Preserve;
- Seward Kobuk Resource Management Plan;
- Arctic National Wildlife Refuge;
- Northwest Alaska Area Plan;
- Central Yukon Resource Management Plan;
- NPR-A Integrated Activity Plan and Environmental Impact Statement;
- Utukok River Uplands Special Area;
- Peard Bay Special Area;
- Colville River Special Area;
- Teshekpuk Lake Special Area;
- Kasegaluk Lagoon Special Area;
- Alaska Maritime National Wildlife Refuge;
- Coastal Plain EIS
- Wild and Scenic Rivers;
- Northwest Alaska Transportation Plan;
- Dalton Highway Master Plan (and related Dalton Highway Recreation Area Management Plan);\(^{380}\) and
- Alaska Department of Natural Resources North Slope Management Plan.

Table 38 provides a comparison of the goals of several land management plans affecting the North Slope.

Land management planning process is an extensive and lengthy process designed to gain public input and comment at several key stages. While the duration of the different phases undertaken within the planning process may differ depending on area of interest, type of plan, and overseeing agency; generally the process consists of eight different milestones, outlined below and shown in Figure 22.

Figure 22: Land Management Planning Process

- Step 1 – Identify issues and concerns to be addressed within/by the planning document.
- Step 2 – Gather information about the natural resources, land use, land ownership, local economy (past, present and future).

• Step 3 – Prepare and evaluate alternative and describe the effects each may have on the overarching goal for the area management.

• Step 4 – Prepare Draft Plan.

• Step 5 – Release Draft Plan for public comment. This step may involve conducting public engagement meetings/open houses etc.

• Step 6 – Prepare Final Plan incorporating received public comments.

• Step 7 – Approve Plan.

• Step 8 – Implement Plan and re-evaluate as needed.

Table 38: Land Use Plans Goal Comparison

<table>
<thead>
<tr>
<th>2019 - 2039 North Slope Borough Comprehensive Plan</th>
<th>2005 North Slope Borough Long Range Transportation Plan</th>
<th>Northwest Area Transportation Plan Draft Goals</th>
<th>Arctic Strategic Transportation and Resources (ASTAR)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Goal 1: Cooperate with land owners and managers to update land use regulations consistent with village priorities.</td>
<td>Goal 1: Provide basic access to social services.</td>
<td>The goal is to develop a strategic plan that first prioritizes community needs and then looks to identify infrastructure opportunities for the most cumulative benefit and quality of life for the region.</td>
<td></td>
</tr>
<tr>
<td>Goal 7: Provide essential public infrastructure and services.</td>
<td>Goal 2: Improve community connectivity through modernization or preservation of the transportation system.</td>
<td>Enhance access to create opportunities to strengthen cultural exchange and community connectivity.</td>
<td></td>
</tr>
<tr>
<td>Goal 1: Cooperate with land owners and land managers to update land use regulations consistent with village priorities.</td>
<td>Goal 2a: Modernize/enhance the system.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal 2: Maximize opportunities by encouraging self-determination.</td>
<td>Goal 2b: Ensure the preservation of the system.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal 4: Improve transportation between North Slope communities.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Plan, design, construct and maintain transportation facilities in a manner that preserves the local environment and subsistence lifestyle.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal 3: Enhance transportation system efficiency.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal 3a: Reduce project costs to design, construct, and maintain.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Goal 3b: Reduce project delivery delays.</td>
<td></td>
<td></td>
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<tr>
<td></td>
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</tr>
<tr>
<td>Maintain a diverse transportation system to support mobility.</td>
<td>Goal 4: Support improvements to transportation levels of services.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019 - 2039 North Slope Borough Comprehensive Plan</td>
<td>2005 North Slope Borough Long Range Transportation Plan</td>
<td>Northwest Area Transportation Plan Draft Goals</td>
<td>Arctic Strategic Transportation and Resources (ASTAR)</td>
</tr>
<tr>
<td>-------------------------------------------------</td>
<td>------------------------------------------------------</td>
<td>-----------------------------------------------</td>
<td>-------------------------------------------------</td>
</tr>
<tr>
<td>Support transportation facilities that provide for social and economic growth.</td>
<td><strong>Goal 5:</strong> Enhance system adaptability and flexibility.</td>
<td></td>
<td>Lower the cost of energy, basic goods, utilities, and other services</td>
</tr>
<tr>
<td><strong>Goal 6:</strong> Develop strong, resilient local and regional economies.</td>
<td><strong>Goal 6:</strong> Facilitate economic development.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Goal 8:</strong> Partner and collaborate with industry for the benefit of borough residents.</td>
<td>Create healthy, safe and efficient transportation.</td>
<td><strong>Goal 7:</strong> Facilitate development of natural resources.</td>
<td>Improve infrastructure to provide community stability and improve public safety</td>
</tr>
</tbody>
</table>
North Slope Borough
Land Management Plans Special Areas
Map 21

- Borough Boundaries
- Colville River Special Area
- National Petroleum Reserve - Alaska
- Kasegaluk Lagoon Special Area
- Utukok River Special Area
- Peard Bay Special Area
- Teshekpuk Lake Special Area

Data Source:
BLM Alaska, National Petroleum Reserve - Alaska
Record of Decision
### Table 39: Land Use Management Plans / Special Areas within the North Slope

<table>
<thead>
<tr>
<th>Land Management Plan</th>
<th>Jurisdiction/Agency</th>
<th>Acreage</th>
<th>Zone of Influence</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gates of the Arctic National Park &amp; Preserve</td>
<td>BLM</td>
<td>8.4 million acres</td>
<td>Straddle the Brooks Range for approximately 200 miles north of the Arctic Circle.</td>
<td>To preserve the vast, wild, undeveloped character and environmental integrity of Alaska’s central Brooks Range and to provide opportunities for wilderness recreation and traditional subsistence uses.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>7.1 million acres designated</td>
<td>Located both within the NSB and the Northwest Arctic Borough.</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>‘wilderness’</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TAPS Utility Corridor</td>
<td>BLM / State of Alaska</td>
<td>6.1 million acres</td>
<td>Route of the Trans Alaska Pipeline System from Prudhoe Bay to Valdez, Alaska.</td>
<td>Multiple use of planning area resources while also providing resource protection. Overriding priority of the plan is to preserve the Utility Corridor for the transportation of energy minerals.</td>
</tr>
<tr>
<td>NPR-A</td>
<td>BLM</td>
<td>23,599,999 acres</td>
<td>North Slope of Alaska, west of the Colville river through to the Chukchi coast.</td>
<td>Originally designated for ensuring U.S. oil reserves, with provisions applying to exploration/production activities and protection of subsistence activities.</td>
</tr>
<tr>
<td>Utukok River Uplands Special Area</td>
<td>BLM</td>
<td>7.06 million acres</td>
<td>Area encompasses foothills of the Brooks Range mountains, tundra and coastal</td>
<td>To protect habitat used by the Western Arctic Caribou Herd for calving and insect relief.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>acres(^{384})</td>
<td>wetlands. Encompassed within the NPR-A.</td>
<td></td>
</tr>
<tr>
<td>Peard Bay Special Area</td>
<td>BLM</td>
<td>107,218 acres</td>
<td>Along the northern coast of Alaska.</td>
<td>Designated area restricts oil and gas activities within the designated boundaries, for the protection of 3 habitat types: haul out areas and near shore waters for marine mammals and high use staging/migration areas for shore and water birds</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Land Management Plan</th>
<th>Jurisdiction/ Agency</th>
<th>Acreage</th>
<th>Zone of Influence</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kasegaluk Lagoon Special Area</td>
<td>BLM</td>
<td>97,408 acres. Spanning 125 miles along Chukchi Sea coast</td>
<td>Encompassed within the NPR-A.</td>
<td>Designated area restricts oil and gas activities within the special area boundaries due to the areas importance for marine mammal habitat and extensive lagoons and barrier islands.</td>
</tr>
<tr>
<td>Coleville River Special Area</td>
<td>BLM</td>
<td>2,442,929 acres</td>
<td>Lands bordered by the Colville, Kogosukruk and Kikiakrorak rivers including bluffs and riparian habitat. Encompassed within the NPR-A.</td>
<td>Designated area restricts oil and gas activities within the designated boundaries</td>
</tr>
<tr>
<td>Teskekpuk Lake Special Area</td>
<td>BLM</td>
<td>3.65 million acres(^{385})</td>
<td>Inclusive of Teskekpuk Lake, north to the Beaufort Sea and Smith and Harrison Bay. Area extends south east and south west of Teskekpuk Lake. Encompassed within the NPR-A.</td>
<td>Set aside for special management because of its unique environmental value. Designated area restricts oil and gas activities within the designated boundaries</td>
</tr>
<tr>
<td>ANWR</td>
<td>USFWS</td>
<td>19,286,722 acres (including Section 1002 (1.5 million acres))</td>
<td>East of the Trans Alaskan Pipeline System to the Canadian border. Section 1002 consists of coastal plain territory</td>
<td>Preservation for research and the protection of nature. Section 1002 area includes natural resources (petroleum) studies.</td>
</tr>
<tr>
<td>Alaska Maritime National Wildlife Refuge</td>
<td>United States Fish and Wildlife Service</td>
<td>34,399 acres</td>
<td>Coastal areas surrounding Point Lay Approximately 21 miles south and 50 miles north of the community.</td>
<td>Protection of diversity of marine and coastal ecosystems. Set aside a network of coastal areas (land and waters) for the conservation of fish, wildlife and plants.</td>
</tr>
</tbody>
</table>


### Land Management Plan

<table>
<thead>
<tr>
<th>Land Management Plan</th>
<th>Jurisdiction/Agency</th>
<th>Acreage</th>
<th>Zone of Influence</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wild and Scenic Rivers</td>
<td>USFWS</td>
<td>3 rivers within the NSB have designation under the Wild and Scenic River Act</td>
<td></td>
<td>To preserve certain rivers with outstanding natural, cultural and recreational values in a free flowing condition for the enjoyment of present and future generations. To safeguard the special character of designated rivers while recognizing the potential for their appropriate use and development. To encourage river management that crosses political boundaries and promoting public participation.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Iviskak Wild &amp; Scenic River (80 miles)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Wind Wild &amp; Scenic River (140 miles)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Sheenjek Wild &amp; Scenic River (160 miles)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dalton Highway Master Plan</td>
<td>ADOT&amp;PF</td>
<td>700,000 acres (estimated)</td>
<td>1 mile west of Livengood, and ends 414 miles north, at the Deadhorse Airport</td>
<td>Removed lands from mineral resource development, and state / Native Alaskan allocation. Corresponding RAMP guides BLM’s recreation facilities along Dalton Highway</td>
</tr>
<tr>
<td>North Slope Management Plan</td>
<td>ADNR</td>
<td>12 million acres of state lands</td>
<td>Uplands, shore lands, tide and submerged lands, north of Atigun Pass encompassing area between eastern boundary of NPR-A and western boundary of ANWR. 3nm offshore limit included.</td>
<td>Long term management of state land and water within the defined zone of influence. Excludes federally selected lands. Increase permitting efficiency and predictability for the public</td>
</tr>
</tbody>
</table>

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CURRENT LAND USE

Community Zoning
Communities within the NSB have a mixture of residential, commercial, mixed use or industrial land uses. Utqiagvik has an additional land use designation of ‘institutional uses’ due to the infrastructure of Ilisaġvik College. The percentage of land use within each zoning district is shown Table 37.

Detailed maps of current and future land use goals within each community are included within the different communities Comprehensive Plans, which are contained as appendices to this Area wide Comprehensive Plan.

North Slope Subsistence Rural Region Designation
Subsistence is defined in Alaska state law as the “noncommercial” customary and traditional uses” of fish and wildlife. These uses include for the purpose of: food, sharing, home and other buildings, fuel, clothing, tools/home goods, transportation and handicrafts. State laws pertaining to subsistence activities differ from federal laws in that under state laws subsistence activities can occur outside of non-subsistence use areas regardless of ethnicity. The federal Marine Mammal Protection Act enables only Alaska Natives who live on the coast of the North Pacific Ocean or the Arctic Ocean to harvest marine mammals for subsistence purposes. Additional information regarding the subsistence culture and its importance to the communities of the North Slope are contained in Chapter 6.

Federal subsistence regulations can undergo review and modification every year. The USFWS, every year, issued a call for proposals to change federal subsistence fishing and wildlife regulations. Any person or group can submit proposals to change federal subsistence regulations, comment of proposed changes or provide comment at meetings. The call for proposals related to subsistence fishing regulations are issued in January of even numbered years (e.g. 2018, 2020). A call for proposals for changing federal wildlife subsistence activities is issued on odd numbered years (e.g. 2017, 2019). Proposal for modification to these regulations can be submitted by anyone, in any written format within a 30 calendar day timeframe stipulated by the USFWS.  

Subsistence Designation
Under the authority of the ANILCA regulations established rural subsistence use on federal lands. Rural / Non rural determinations are for the purpose of identifying rural residents who may harvest fish and wildlife for subsistence uses on federal public lands in Alaska. Title VIII of ANILCA declares that the continuation of the opportunity for subsistence uses by rural residents of Alaska... on the public lands and by Alaska Natives on Native lands is essential to Native physical, economic, traditional and cultural existence.

ANILCA “§242.15 Rural determination process, governs such designations:
(a) The Board shall determine if an area or community in Alaska is rural. In determining

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whether a specific area of Alaska is rural, the Board shall use the following guidelines:

(1) rural unless such a community or area possesses significant characteristics of a non-rural nature, or is considered to be socially and economically a part of an urbanized area.

(2) Communities or areas with populations above 2,500 but not more than 7,000 will be determined to be rural or non-rural.

(3) A community with a population of more than 7,000 shall be presumed non-rural, unless such a community or area possesses significant characteristics of a rural nature.

(4) Population data from the most recent census conducted by the United States Bureau of Census as updated by the Alaska Department of Labor shall be utilized in this process.

(5) Community or area characteristics shall be considered in evaluating a community's rural or non-rural status. The characteristics may include, but are not limited to:

(i) Use of fish and wildlife;
(ii) Development and diversity of the economy;
(iii) Community infrastructure;
(iv) Transportation; and
(v) Educational institutions.

(6) Communities or areas which are economically, socially, and communally integrated shall be considered in the aggregate.

(b) The (Federal Subsistence) Board shall periodically review rural determinations. Rural determinations shall be reviewed on a 10-year cycle, commencing with the publication of the year 2000 U.S. Census. Rural determinations may be reviewed out-of-cycle in special circumstances. Once the Board makes a determination that a community has changed from rural to non-

As noted within §242.15(a)(2), the largest community in the North Slope, Utqiaġvik, is still considered to be ‘rural’ in nature. For this designation to be removed, Utqiaġvik’s population would need to exceed 7,000 residents as recorded by the U.S. Bureau of Census, for the community to lose its presumptive designation as part of the North Slope Subsistence Rural Region (NSSRR). The latest NSB Census reported a population of 4,974; with a decreased population of 4,825 by 2014. Based on population trends and projections for Utqiaġvik, as detailed in Chapter 4, its designation as a NSSRR may not be in jeopardy until 2037. The remaining communities of the North Slope are not expected, based on population trends and projections, to lose their NSSRR designation in the foreseeable future.

Should Utqiaġvik’s population exceed the 7,000 person upper threshold that would revoke its NSSRR designation, the USFWS does have a process for communities to engage in for reinstating this status. The community can petition the Federal Subsistence Board to retain its status as part of the NSSRR.

Historical Structures and Lands

The North Slope Borough has a rich historical and cultural legacy that expands back thousands of years. Such historically important sites are
reflected in the Birnirk Archeological Site, a 16 mound Birnirk and Thule culture historic landmark, the Archeological district near Anaktuvuk Pass and its findings on about the Arctic Small Tool Tradition, and too many other culturally important sites throughout the North Slope, to mention here. Chapter 1 contains additional detail on the historical locations throughout the borough. The wealth of historical sites throughout the borough, does however impact land use activities, currently, as well as in the future.

Existing Infrastructure
Over the course of the last forty years, lease holders have developed an extensive network of gravel roads, pads and other infrastructure that in the strictest sense must all be removed in accordance with the DR&R provisions of their leases and unit agreements.

With very few exceptions, the roads and ports are not classified that same way public infrastructure would be defined, making it difficult to determine the best way forward to provide valuable infrastructure to the local organizations while also address the DR&R liability of the companies that constructed it for oil and gas development.

Some of this infrastructure should remain. The central road network (the Spine Road) and its key offshoots to Milne Point, Oliktok Point, Endicott and West Dock are critical road and dock facilities that should be sustained by the state or borough to address increased arctic shipping activities and the potential need for spill response.
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North Slope Borough
Anaktuvuk Pass Land Ownership
Map 24
North Slope Borough
Atqasuk Land Ownership
Map 25

Data Sources:
North Slope Borough
North Slope Borough
Nuiqsut Land Ownership
Map 27
North Slope Borough
Point Hope Land Ownership
Map 28

Zoning District
North Slope Borough
Point Lay Land Ownership
Map 29
North Slope Borough
Utqiagvik Land Ownership
Map 30
North Slope Borough
Wainwright Land Ownership
Map 32

Data Sources:
North Slope Borough

- Corporation
- City
- Housing Authority
- Lessee
- Native Restricted

- North Slope Borough
- Private
- Religious
- State of Alaska
- Tribal Government

Zoning District
North Slope Borough
Land Use
Map 34
FUTURE LAND USE

While each community is distinct, they do all share common land use goals and issues.

Community Zoning
All communities have a demonstrated need for increased housing. Accompanying the need for increased housing is the need for designated utility and road rights of way. Meeting this need will be a result of appropriately conveyed lands, potential modification of community zoning and land designations by the NSB and community economics as the cost of residential developments are considerably higher and more challenging for residents on the North Slope, then in other more southerly locations in the state.

Climate Change
All communities land use practices and lands available for use, are impacted daily by climate change.

Recent storms in 2017 are continuing to impact coastal communities, through coastal erosion, flooding and eroding away streets and access roads, as well as critical infrastructure such as marine headers needed for the community’s annual delivery of fuel, or waste water outfall areas (e.g. Wainwright). Fortifying coastal areas, at times on an annual basis, are costly to the community and to the borough, diverting funds from other needed community improvement or growth projects. Climate change is impacting the way the borough as well as its residents use the land. Subsidence and melting permafrost is impacting placement of gravel pads needed for infrastructure development, while on a personal

/individual level, residents are experience a loss of permafrost which is impacting the usability of ice cellars. Additional details on climate change and the impacts felt by the communities and the NSB in found is Chapter 5.

ANCSA 14(c)
Ongoing ANCSA Section 14(c)(3) conveyance requirements will further impact land use opportunities and activities. Finalization of 14(c)(3) land conveyances from the village corporations of Kaktovik and Utqiaġvik have been received and accepted by the BLM. Needed information such as a map of boundaries from Anaktuvuk Pass, Atqasuk, Nuiqsut, Point Hope, and Point Lay are still required before completion of the 14(c) conveyance process can occur. Surveying of agreed upon conveyed land within Wainwright is anticipated to occur in 2018. This land transfer process and the length of time required to finalize this transfer will have a direct impact on the future land use within the various communities.

Recent Records of Decision (RODs) from the BLM for ANWR and political federal initiatives for Section 1002 in ANWR regarding oil and gas resource development opportunities has the potential to significantly impact land use opportunities for surrounding communities and for the NSB. Should these RODs and political initiatives result in expanded oil and gas exploration, the state, the borough and the surrounding communities could benefit through increased revenue, increased zoning requirements and permit processing, increased employment opportunities and potentially increased infrastructure being needed within the communities to support the development (e.g. increased roads, utilities etc.).

PART II | CHAPTER 15: LAND USE & LAND MANAGEMENT

NORTH SLOPE BOROUGH
ARCTIC COMPENSATIVE PLAN 2019—2039

PAGE 373
COMMUNITY INPUT, FINDINGS, NEEDS, AND CHALLENGES

The North Slope has a myriad of landowners, land managers, and land rights at all levels of government, making coordinate and development difficult processes. ANCSA, the state municipal entitlements, Native restricted properties provide an additional layer of complexity.

Land use and land management issues and concerns identified by workshop participants are provided in Chapter 2 and listed below:

- Permitting process allows industry to develop where and when they want; industry not required to address residents’ concerns
- Better collaboration on comprehensive plans at department level
- Contaminated federal site clean-up lack of coordination and land use planning
- Inconsistency and complicated co-management regimes (fed, state)
- Funding for homes and renovations on Native restricted lots is difficult
- Probate issues limit use of many Native restricted lots
- NSB Titles 17, 18, 19 could incorporate building standards and/or a building official
- Condos or zero lot line homes for those that wish to purchase a starter/less expensive home

<table>
<thead>
<tr>
<th>Findings</th>
<th>Needs &amp; Challenges</th>
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<tbody>
<tr>
<td>NSB municipal land entitlements have not been completed. DNR has conveyed approximately 12,000 acres of the borough’s 89,850 acres entitlement.</td>
<td>The state needs to reclassify parcels already classified for oil and gas development so that they can be used for multiple purposes by NSB.</td>
</tr>
<tr>
<td>Over 85 percent of the North Slope Borough’s land selections have not been adjudicated.</td>
<td>Reclassified state lands and conveyed to NSB via municipal land entitlement would allow the borough to support gravel needs for itself and for industry.</td>
</tr>
<tr>
<td>The vast majority of land within the borough is zoned Conservation (96 percent), which is intended to conserve the natural ecosystem</td>
<td>Industry and others should limit air and ground traffic and consolidate transportation to and from worksites to minimize disturbances to wildlife, emissions of dust and limit impacts to tundra.</td>
</tr>
<tr>
<td>Planning goals in federal, state, and local plans should be consistent.</td>
<td>Industry should monitor air emissions and harmful chemical constituents at the right times and locations and publically release any data that may inform human health impacts.</td>
</tr>
<tr>
<td>Conflict avoidance agreements have successfully brought together developers and subsistence whalers to mitigate impacts to subsistence whaling activities.</td>
<td>Partnerships between industry and local communities, businesses, and native organizations to promote local employment, training, and educational opportunities should be encouraged.</td>
</tr>
<tr>
<td>State and local governments currently have very little to gain from natural resource exploration and development offshore.</td>
<td>Development and implementation of a revenue sharing mechanism that allows state and local communities to share in the profits of offshore development.</td>
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PRIMARY LAND USE AND LAND MANAGEMENT GOALS

Goal 1: Cooperate with landowners and land managers to update land use regulations consistent with village priorities.

Objective 1. Land use regulations and procedures should reflect current goals and priorities.

1.1.1. Revise the borough’s zoning and subdivision ordinances for consistency with the goals of this plan and borough priorities.

1.1.2. Ensure revised zoning and land use regulations provide positive impacts and do not allow incompatible uses.

1.1.3. Encourage infill development with parcels already served by roads and water and sewer connections, potentially through incentives.

1.1.4. Incorporate traditional knowledge into local regulations as appropriate.

1.1.5. Protect subsistence corridors and hunting and fishing areas through the development of a subsistence zoning district.

1.1.6. Ensure inclusion of villages in the notification and decision-making process before permits are issued.

1.1.7. Establish future transportation and utility corridors where appropriate with collaboration with federal and state agencies and landowners.

1.1.8. Develop design and building standards that reflect the arctic climate and culture.

1.1.9. Ensure rezoning, subdivisions, and permitting processes are streamlined, predictable, and understandable.

Objective 2: Promote cooperation between Native, federal, and state, local and private entities.

1.2.1. Recognize and respect that North Slope communities have different land use planning and development needs.
1.2.2. Create a strategy with the respective state and local decision-makers to complete the land selection process for the borough, Native corporations, and municipalities to more effectively and cooperatively plan for land management and current and future needs.

1.2.3. Develop cooperative agreements between landowners, cities, NSB, and state and federal regulatory agencies to coordinate land development funding and logistics.

1.2.4. Coordinate closely with state and federal regulators to ensure that village residents’ concerns are considered and addressed in oil and gas development proposals.

1.2.5. Increase partnerships between the NSB, Tribal and city governments, and Native corporations.

1.2.6. Remain actively engaged in state and federal land use planning and development within the borough through participation on committees, maintaining a strong relationship with agencies representatives, and consistently providing comments on potential actions.

Objective 3: Ensure comprehensive plans remain relevant.

1.3.1. Include a staggered review of comprehensive plans as part of the NSB Planning Commission’s annual calendar as needed and required by ordinance.

1.3.2. Adequately fund and prioritize comprehensive plan reviews and updates.

1.3.3. Review and update the NSB Comprehensive Plan and village comprehensive plans vision statements, background research, and goals every five years.

1.3.4. Update the comprehensive plans thoroughly at least every ten years.

1.3.5. Establish a committee, potentially comprised of Planning Commissioners, residents, NSB Mayor’s office and NSB Planning & Community Services Department staff, and others to steward the comprehensive plans and monitor and facilitate implementation progress.

1.3.6. Conduct regular reviews of implementation efforts by the NSB Planning & Community Services Department.

1.3.7. Incorporate the comprehensive plans into the annual capital improvement planning process.
Goal 2: Maximize opportunities by encouraging self-determination.

Objective 1: Seek ways for communities to become more self-sufficient.

2.1.1. Seek local involvement consistency, especially through community leadership participation and input.

2.1.2. Proactively involve students and young adults to train future community leaders and convey the importance of community involvement.

2.1.3. Develop a pilot program to create a village planning commission(s) if desired.

2.1.4. Identify ways that villages can have more control over local issues.

2.1.5. Facilitate positive relationships building between entities within each community to spur interaction and coordination.

Objective 2: Adjust each borough program to specific community needs.

2.2.1. Investigate creating a NSB department of natural resources to develop natural resources for borough residents, to become a leader in resource development, protect critical areas of the region important for subsistence activities, and to act as a central resource for climate change issues.

2.2.2. Take advantage of the existing regulatory procurement process to work more closely with village corporations, 8a disadvantaged business enterprise program (DBE) businesses, and long-term contracting in the public interest with Public Interest Determination (PID) contracting.

2.2.3. Develop stronger relationships between the NSB and village corporations, potentially through memorandums of understanding to further common interests.

2.2.4. Foster programs to train police officers, teachers, pilots, and other professionals from within the region.

2.2.5. Increase partnerships between the NSB, Tribal and city governments, regional governments, Native corporations, and other stakeholder organizations to reduce duplicity in services and increase efficiency.
2.2.6. Research the feasibility of merging similar programs, activities, and providers, such as ASNA and the NSB Health & Social Services Department.

2.2.7. Review insurance requirements to ensure that they are a necessary for small contractors.

2.2.8. Develop succession plans for critical positions to ensure continuity in service delivery.

2.2.9. Implement programmatic or other changes in one village as pilot programs to demonstrate successes.

Objective 3: Strengthen relationships with external agencies for the benefit of residents.

2.3.1. Develop recommendations for use by outside entities in communicating with village residents that include advance contact and scheduling, meeting consolidation to avoid meeting fatigue, and consideration of village subsistence activities and other local priorities and activities.

2.3.2. Participate in regular regional planning with neighboring jurisdictions, such as the Northwest Arctic Borough and the Yukon-Koyukuk Borough.

2.3.3. Encourage interagency and science research coordination in research, planning, and regulatory changes.

2.3.4. Seek effective opportunities for agency participation and coordination with villages, including encouraging use of subsistence observers and sharing information.
Part III: North Slope Goals
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CHAPTER 16: PLAN IMPLEMENTATION

GOALS, POLICIES, AND IMPLEMENTING STRATEGIES

The goals, objectives, and strategies contained in this chapter are intended to reflect the values of the North Slope region. They are also intended to respond to the Strengths, Weaknesses, Opportunities and Threats discussions in meetings hosted by the North Slope Borough Planning and Community Services Department during development of this plan and guidance provided by the North Slope Borough Administration. The goals are not presented in priority order.

Each goal is accompanied by one or more objective that suggests how the community might achieve the intent and substance of the goal. Each objective is followed by an Implementing Strategy that describe how the action would be implemented. Implementing Strategies may establish how a specific course of action could be accomplished by NSB Administration and staff, NSB legislators, various development permitting and funding agencies, village residents, village leadership, and/or other entities.

**GOALS** are broad statements that describe long-term desired outcomes

**OBJECTIVES** are measurable steps to achieve a goal

**IMPLEMENTING STRATEGIES** describe specific steps to reach an objective or goal
Land use patterns and decisions are influenced by population, economic growth, transportation access and opportunities, availability of infrastructure, environmental constraints, and proximity to services, among others. In much of the country, these decisions are largely made by the private sector. Across the North Slope region, these decisions are primarily made by the regional government and federal and state land managers. Within each North Slope community, land use decisions are made by local landowners, primarily village corporations, and the North Slope Borough. All the decisions are made within the framework of development regulations and long range comprehensive planning documents, such as this North Slope Borough Comprehensive Plan, that encourage or discourage certain types of uses and development in certain areas.

**Goal 1.** Cooperate with landowners and land managers to update land use regulations consistent with village priorities.

**Objective 1. Land use regulations and procedures should reflect current goals and priorities.**

**Implementing Strategies**

1.1.1. Revise the borough’s zoning and subdivision ordinances for consistency with the goals of this plan and borough priorities.

1.1.2. Ensure revised zoning and land use regulations provide positive impacts and do not allow incompatible uses.

1.1.3. Encourage infill development with parcels already served by roads and water and sewer connections, potentially through incentives.

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1.1.5. Protect subsistence corridors and hunting and fishing areas through the development of a subsistence zoning district.

1.1.6. Ensure inclusion of villages in the notification and decision-making process before permits are issued.
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1.1.9. Ensure rezoning, subdivisions, and permitting processes are streamlined, predictable, and understandable.

**Objective 2: Promote cooperation between Native, federal, and state, local and private entities.**

**Implementing Strategies**

1.2.1. Recognize and respect that North Slope communities have different land use planning and development needs.

1.2.2. Create a strategy with the respective state and local decision-makers to complete the land selection process for the borough, Native corporations, and municipalities to more effectively and cooperatively plan for land management and current and future needs.

1.2.3. Develop cooperative agreements between landowners, cities, NSB, and state and federal regulatory agencies to coordinate land development funding and logistics.

1.2.4. Coordinate closely with state and federal regulators to ensure that village residents’ concerns are considered and addressed in oil and gas development proposals.

1.2.5. Increase partnerships between the NSB, Tribal and city governments, and Native corporations.

1.2.6. Remain actively engaged in state and federal land use planning and development within the borough through participation on committees, maintaining a strong relationship with agencies representatives, and consistently providing comments on potential actions.

**Objective 3: Ensure comprehensive plans remain relevant.**

**Implementing Strategies**

1.3.1. Include a staggered review of comprehensive plans as part of the NSB Planning Commission’s annual calendar as needed and required by ordinance.

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1.3.6. Conduct regular reviews of implementation efforts by the NSB Planning & Community Services Department.

1.3.7. Incorporate the comprehensive plans into the annual capital improvement planning process.

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**Self-Determination**

Residents must have opportunities for involvement in that decisionmaking that affects their communities. Programs and policies often have a long lifespan and need community input in their development, implementation, assessment, and improvement to be successful. A comprehensive plan is a broad framework that requires resident input on many factors affecting a community or region. This is one of several prominent ways that the borough and its residents have to provide guidance and self-determination of the future. Because it is sufficiently broad, a comprehensive plan can be used to provide guidance on many regulations, policies, and initiatives. There are also many more in-depth studies that can provide further analysis on issues brought to the forefront in a comprehensive plan by residents.

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**Goal 2.** Maximize opportunities by encouraging self-determination.

**Objective 1:** Seek ways for communities to become more self-sufficient.

**Implementing Strategies**

2.1.1. Seek local involvement consistency, especially through community leadership participation and input.

2.1.2. Proactively involve students and young adults to train future community leaders and convey the importance of community involvement.
2.1.3. Develop a pilot program to create a village planning commission(s) if desired.

2.1.4. Identify ways that villages can have more control over local issues.

2.1.5. Facilitate positive relationship building between entities within each community to spur interaction and coordination

Objective 2: Adjust each borough program to specific community needs.

Implementing Strategies

2.2.1. Investigate creating a NSB department of natural resources to develop natural resources for borough residents, to become a leader in resource development, protect critical areas of the region important for subsistence activities, and to act as a central resource for climate change issues.

2.2.2. Take advantage of the existing regulatory procurement process to work more closely with village corporations, 8a disadvantaged business enterprise program (DBE) businesses, and long-term contracting in the public interest with Public Interest Determination (PID) contracting.

2.2.3. Develop stronger relationships between the NSB and village corporations, potentially through memorandums of understanding to further common interests.

2.2.4. Foster programs to train police officers, teachers, pilots, and other professionals from within the region.

2.2.5. Increase partnerships between the NSB, Tribal and city governments, regional governments, Native corporations, and other stakeholder organizations to reduce duplicity in services and increase efficiency.

2.2.6. Research the feasibility of merging similar programs, activities, and providers, such as ASNA and the NSB Health & Social Services Department.

2.2.7. Review insurance requirements to ensure that they are a necessary for small contractors.

2.2.8. Develop succession plans for critical positions to ensure continuity in service delivery.

2.2.9. Implement programmatic or other changes in one village as pilot programs to demonstrate successes.
Objective 3: Strengthen relationships with external agencies for the benefit of residents.

Implementing Strategies

2.3.1. Develop recommendations for use by outside entities in communicating with village residents that include advance contact and scheduling, meeting consolidation to avoid meeting fatigue, and consideration of village subsistence activities and other local priorities and activities.

2.3.2. Participate in regular regional planning with neighboring jurisdictions, such as the Northwest Arctic Borough and the Yukon-Koyukuk Borough.

2.3.3. Encourage interagency and science research coordination in research, planning, and regulatory changes.

2.3.4. Seek effective opportunities for agency participation and coordination with villages, including encouraging use of subsistence observers and sharing information.

Housing

Safe, healthy, stable, and access to housing are important factors in quality of life. There is a severe housing shortage across the North Slope, with multiple generations of families living in overcrowded conditions. Additionally, many homes need weatherization improvements, basic home repairs, and air quality assessments to ensure healthy living conditions. Yet these assessments and repairs are difficult to obtain in the remote villages. Homelessness is also pervasive across the North Slope.

Goal 3.

Develop a housing program to address dilapidated infrastructure and housing shortage.

Objective 1: Develop a policy on the borough’s role in public and private housing.

Implementing Strategy

3.1.1. Establish a coalition to address housing and homelessness issues on the North Slope to coordinate programs and initiatives.
Objective 2: Promote development of new public and private housing.

Implementing Strategies

3.2.1. Encourage duplexes, triplexes, and larger multi-family house to provide more affordable housing options.

3.2.2. Amend the zoning ordinance to allow condominiums and zero lot line homes to increase the range of affordability options.

3.2.3. Identify and explore the applicability of housing alternatives that allow for accessory dwelling units and smaller housing units to meet the demand for smaller and more affordable housing.

3.2.4. Encourage the use of existing public infrastructure by focusing housing development on infill, vacant, and underdeveloped land.

3.2.5. Extend roads and utilities to lots to facilitate more housing development when and where feasible.

3.2.6. Seek alternative funding sources for constructing homes on Native restricted lots.

3.2.7. Investigate the feasibility of constructing modular or 3-D printed homes on the North Slope that are easy to transport to villages and to lots.

3.2.8. Research incentives for private developers to invest in housing on the North Slope.

3.2.9. Work with housing authorities to construct additional rental housing to expand housing choice.

3.2.10. Seek solutions to village senior housing five-plexes that are not being fully utilized.

Objective 3: Create programs to address dilapidated housing conditions, weatherization upgrades, air quality and general home repairs.

Implementing Strategies

3.3.1. Support programs that help with weatherization and sustainability measures to reduce home operating costs for water and energy usage.
3.3.2. Seek and/or allocate funding for home maintenance assistance to benefit low-income, disabled residents, and Elders with ongoing maintenance needs.

3.3.3. Seek funding to help provide repairs to the most critical homes needing repairs and air quality improvements to make them healthy for habitation.

3.3.4. Work closely with Tribal, city, and Native corporations to establish village storefronts to loan equipment and tools and offer home repair technical assistance.

**Objective 4: Assist residents in obtaining financing and resolving probate issues.**

**Implementing Strategies**

3.4.1. Support financial education and financial management programs that help residents understand the true costs of homeownership and assist in navigating the process of buying, maintaining, and keeping homes.

3.4.2. Create an Alaska Native Homeownership Coalition for a one-stop shop for grant and loan opportunities for homeownership.

3.4.3. Advocate state congressional representatives in the United States to seek exceptions to the income limit for federal housing subsidies for rural Alaska.

3.4.4. Offer guidance and assistance in remedying restricted property probate issues to better utilize existing lots, including parcel research and assistance in obtaining consensus with multiple heirs.

**Objective 5: Create programs to address homelessness.**

**Implementing Strategies**

3.5.1. Investigate the costs and feasibility of establishing homeless shelters in Utqiaġvik and the villages.

3.5.2. Support transitional homes for families that have experience a fire, flood, or other emergency that does not allow them to live in their home.
Transportation

Both the village and regional transportation systems are critically important to maintaining and improving the quality of life and livability of the North Slope. Investments in physical infrastructure, developing partnerships, and conducting research, feasibility analyses, and future needs assessments will further the borough’s transportation network to meet the needs of residents, industry, and the State of Alaska.

**Goal 4.** Improve the borough’s transportation network between communities.

**Objective 1: Focus efforts to improve inter- and intra-community connectivity.**

**Implementing Strategies**

4.1.1. Investigate ways to entice additional airlines to serve North Slope villages in an effort to increase competition, choice, efficiency, and cost.

4.1.2. Ensure close involvement in any program to connect villages to the road system, which would allow greater infrastructure expansion and investment in villages but could also negatively affect residents through importation of alcohol and drugs and interrupt subsistence activities and caribou migration routes.

4.1.3. Extend village roads to support community growth and new housing to alleviate overcrowding.

4.1.4. Support community dust control efforts and seek new and innovative methods to suppress excessive dust to further public health.

4.1.5. Improve road and airport maintenance budgeting tools to better track and forecast expenditures.

4.1.6. In Utqiagvik, coordinate with ADOT&PF on lease areas and street realignment to improve airport loading and unloading and traffic congestion.

4.1.7. Stake and map trails and provide trail coordinates to travelers for safe navigation.
Objective 2: Coordinate efforts with outside agencies to develop more efficient marine, air and road transportation corridors.

Implementing Strategies

4.2.1. Actively participate in and promote public review and input into the writing, review and approval of any transportation or utility corridors, plans or routes undertaken by the borough, state, or federal government within the NSB.

4.2.2. Develop regulations and guidelines for proper siting, design, construction, and maintenance of transportation facilities so as to not adversely impact subsistence resources.

4.2.3. Continue important efforts to develop a port on the North Slope due to the recent increase in marine traffic, a trend likely to continue well into the future.

4.2.4. Ensure the airport facilities within the borough continue to meet the needs of residents and the local economy through regular needs assessments and usage data.

4.2.5. Reserve land for future transportation needs and activities through easements and land acquisition.

4.2.6. Develop a program to anticipate advances in transportation technology and other innovations.

4.2.7. Establish development nodes along Dalton Highway.

4.2.8. Coordinate with ADOT&PF to potentially manage state operated on the North Slope.

4.2.9. Seek bonding and other funding for port one or more facilities from non-borough entities.

Objective 3: Work with Industry to develop mutually beneficial transit on the slope.

Implementing Strategies

4.3.1. Seek assistance and funding from industry for transportation needs

4.3.2. Seek borough right-of-first refusal on remediated abandoned industry gravel roads.
Iñupiaq Language and Subsistence

Residents of the North Slope honor cultural ties to the land and ancestors when practicing traditional Iñupiaq values. The Iñupiaq highly regard family, work ethic, the Iñupiaq language, traditional drumming and dancing, subsistence hunting and gathering, and sharing food. Yet to the Iñupiaq community and those that have come from elsewhere making the North Slope their home, the gradual loss of Native Iñupiaq speakers and respect of the traditional values and way of life affects the entire region. Strengthening efforts to save the Iñupiaq language and install traditional values is paramount the North Slope retaining its cultural identity.

Objective 1: Focus efforts to more fully integrate Iñupiaq language and culture into the education and land use planning process.

Implementing Strategies

5.1.1. Improve Native language fluency through partial or full immersion programs from pre-kindergarten through high school.

5.1.2. Seek funding and opportunities to assist fluent Iñupiaq speakers to become certified teachers.

5.1.3. Encourage the North Slope Borough School District and educators to further incorporate traditional and cultural values throughout the school curricula.

5.1.4. Integrate Elders into school activities through shared lunches, invitations to speak with classes, and involvement in student projects.

5.1.5. Teach traditional values to new generations by highlighting local success stories and how traditional and cultural values assisted in their success.

5.1.6. Educate state, federal and local government entities, and the oil and gas industry about the importance of traditional and contemporary local knowledge to borough residents.

5.1.7. Require that master plans, rezonings, and applicable permits incorporate aspects of traditional and contemporary local knowledge into a project’s planning and design.
5.1.8. Review environmental assessments and environment impact analyses to ensure they include information on the importance of subsistence, traditional and contemporary local knowledge, and the Iñupiaq culture on the North Slope and provide comments to the lead federal agency to request additional information be included, if applicable.

5.1.9. Remain cognizant that road connections will bring societal changes and prepare for those changes in advance to the extent possible.

**Objective 2: Protect and enhance access for traditional subsistence activities to ensure food security and cultural values.**

**Implementing Strategies**

5.2.1. Recognize the importance of traditional camps and cabins, and associated subsistence activities when managing public lands and planning for leasing, exploration, and development of petroleum and mineral resources.

5.2.2. Work with the Alaska Department of Fish and Game and state and federal land managers to reduce effects on subsistence activities from outside sport and commercial hunting and fishing activities.

5.2.3. Develop low-flying aircraft regulations where applicable and coordinate with state and federal agencies to minimize flight disturbances to subsistence activities.

5.2.4. Manage growth along the Dalton Highway Corridor that ensures adequate public safety, wildlife management, and subsistence resource protection.

5.2.5. Encourage more research and coordination on studying and mitigating any potential effects of future road corridors on caribou migration.

5.2.6. Encourage oil companies to allow subsistence users access to oil field roads and to limit public access.

5.2.7. Encourage industry and the State of Alaska to work with local residents when designing new roads to determine if it would be desirable to include pullouts to accommodate subsistence users.

5.2.8. Educate non-borough residents that travel to the North Slope about subsistence resources and how to minimize their impact to these resources.
5.2.9. Develop formal agreements between landowners and land managers to provide subsistence access across private, state, and federal lands.

5.2.10. Plan, design, construct, and maintain infrastructure and facilities in a manner that preserves the local environment and subsistence lifestyle.

5.2.11. Develop ice cellar guidelines to assist residents in improving the storage environment in existing cellars and creating new cellars in the most beneficial locations and design.

Economic Development

The economy of the North Slope is primarily focused on the oil and gas industry in the greater Prudhoe Bay area. While industry employs relatively few North Slope residents, revenue from property taxes on oil and gas infrastructure make-up a substantial portion of the borough operating budget. Training local residents and seeking new economic planning and development opportunities are critical to furthering the borough’s economic development goals.

Objective 1: Encourage collaborative agreements, invest in training, and seek new industries for economic development of the region.

Implementing Strategies

6.1.1. Engage in regional efforts to create a trained local workforce, including collaborative efforts with Ilisagvik College, the State of Alaska, and industry.

6.1.2. Investigate the feasibility of establishing an extension of Ilisagvik College in Deadhorse to train residents for work in the oil industry.


6.1.4. Research viable industries for the North Slope, such as data storage.

6.1.5. Investigate burgeoning employment opportunities due to improved fiber optic communications.
6.1.6. Develop a North Slope Borough Economic Development Plan to foster new economic development compatible with local values.

6.1.7. Participate in local and regional efforts by Tribal governments, Native corporations, and local governments to prepare economic development plans.

6.1.8. Investigate the potential of mineral extraction by the borough for the benefit of residents.

6.1.9. Continue to invest in creating childcare centers in all North Slope communities to assist working parents.

6.1.10. Assist in entrepreneurs in developing small businesses utilizing training services and loans.

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**Public Infrastructure & Services**

The North Slope Borough provides the majority of public infrastructure and services for residents of the North Slope, including water, sewer, transportation, schools, electricity, snow fences, and snow removal. The importance of not only planning for and funding infrastructure expansion to meet future needs, but also ensuring its continued maintenance in the harsh arctic climate is considerable.

**Goal 7.** Provide essential public infrastructure and services.

**Objective 1:** Seek program improvements to better maintain infrastructure and consolidate and share services.

**Implementing Strategies**

7.1.1. Implement a program for consistency and standardization of utilities in general, and utility technology, construction, and maintenance software programs specifically, for easier maintenance and upgrades.

7.1.2. Focus oversight of gravel inventories and demand within NSB to a single department or division to better coordinate inventories and needs.
7.1.3. Investigate consolidating facilities that provide similar or the same operations or services, such as NSB and NSBSD maintenance and operations facilities and general office space.

7.1.4. Facilitate shared use of village facilities to benefit all village residents, such as community use of school swimming pools and other recreational space.

7.1.5. Avoid expanding the borough’s services and infrastructure until deferred capital maintenance and replacement needs are met.

7.1.6. Regularly update and maintain the NSB Repair and Replacement Schedule to better understand and plan for maintenance and replacement needs.

7.1.7. Seek innovative ways to coordinate or consolidate infrastructure, such as constructing one ice road and accessing a toll for industry use.

7.1.8. Research potential ramifications of climate change on the region’s infrastructure and plan accordingly.

7.1.9. Emphasize compactness in community development during project planning to minimize operations, maintenance, and expansion costs of community infrastructure.

7.1.10. Prohibit independent utility systems and connections to municipal utility systems until guidelines are in place for local service area development.

7.1.11. Develop a program to confirm easements in place for existing snow fences and other public infrastructure.

7.1.12. Evaluate alternative options to gravel to aid in fulfill community gravel needs.

**Objective 2: Address current critical infrastructure needs and plan for future needs.**

**Implementing Strategies**

7.2.1. Develop alternative/secondary water sources to ensure continued availability.

7.2.2. Proactively maintain roads that provide access to critical infrastructure, such as the landfill, water source, or natural gas facilities.

7.2.3. Proactively protect critical infrastructure from unforeseen events, such as flooding and storm events.
7.2.4. Renovate or demolish NSB-owned facilities and infrastructure that are beyond their useful life and coordinate with other agencies to renovate or remove dilapidated infrastructure where needed.

7.2.5. Seek equity in village infrastructure and facilities.

7.2.6. Invest in heavy equipment repairs and replacement and transport replaced equipment out of villages.

7.2.7. Assist local efforts to secure search and rescue facility space in the villages.

7.2.8. Investigate alternative technologies for supplying improved communications systems.

7.2.9. Enhance current communications networks within villages to maximize improved subsea fiber optic connections.

7.2.10. Seek funding for development of terrestrial high-speed fiber optic networks to inland communities.

7.2.11. Coordinate with educational institutions on technology needs.

---

**Partnerships**

Partnerships and collaboration with stakeholders working within the North Slope Borough will benefit residents through increased outside understanding of the culture and traditional values, subsistence access preservation, funding for programs and initiatives, and ensuring industry is working responsibility.

---

**Goal 8.** Partner and collaborate with Industry for the benefit of borough residents.

**Objective 1: Ensure Service Areas are keeping up with industry needs.**

**Implementing Strategies**

8.1.1. Investigate the need and feasibility to establishing an additional service area to support expansion into ANWR 1002 area of new oil exploration and production.

8.1.2. Investigate the need of expanding Service Area 10 and offering additional services to users.
Objective 2: Maintain Good Neighbor Policies and Conflict avoidance agreements.

Implementing Strategies

8.2.1. Maintain access to subsistence activities.

8.2.2. Encourage input from affected residents on contents of agreements.

Objective 3: Identify ways that resource development can benefit residents directly.

Implementing Strategies

8.3.1. Ensure that the resources that are extracted from the North Slope are also provided to the North Slope residents, such as liquefied natural gas.

8.3.2. Document beneficial and adverse impacts from industry activities on subsistence.

8.3.3. Coordinate with industry and land management agencies to reduce the footprint of resource development and joint use of facilities.

8.3.4. Incorporate local concerns and suggestions in exploration permit approvals and denials, and document measures that have been successful or unsuccessful.

Energy

The North Slope Borough highly subsidizes both the transportation and production of fuel for electricity and heating, costing millions of dollar per year. Heating fuel is distributed to local village corporations at no charge; the village corporations charge for the cost of residential delivery. Likewise, NSB subsidizes the cost of fuel for power generation. Seeking alternative energy sources and distribution methods as well as energy efficiencies would likely result in a significant savings, reduce dependence on the limited fuel delivery schedule, and reduce energy demand. However, determining feasible alternatives, creating distribution corridors, and the capital needs for a regional distribution system may currently be cost prohibitive.

Goal 9. Attain energy independence and energy security.
Objective 1: Develop alternative and redundant energy sources.

Implementing Strategies

9.1.1. Extend natural gas to villages where practicable.

9.1.2. Continue research into alternative energy sources, and implement where feasible.

9.1.3. Research and develop alternative energy sources for borough communities, such as coal, natural gas and wind power.

9.1.4. Construct redundant energy development and distribution to ensure continuity of service.

Objective 2: Develop regional energy plans.

Implementing Strategies

9.2.1. Investigate developing energy corridors between communities for regional power distribution.

9.2.2. Cultivate partnerships with public/private development to foster development that would provide connection to regional power.

Objective 3: Seek energy efficiency upgrades.

Implementing Strategies

9.3.1. Ensure regular maintenance and efficiency improvements of power plants.

9.3.2. Implement a program to regularly inspect and weatherize buildings for maximum energy savings.

9.3.3. Utilize waste heat recovered from community power generation.
Environment

The residents of the North Slope are intrinsically connected with the arctic natural landscape. It is along the Arctic Coastal Plain where Iñupiaq whalers cut trail across the rugged shore ice to hunt for the bowhead whale as their ancestors have done for generations. It is through the Brooks Range and to the Chukchi and Beaufort sea coasts that Iñupiaq subsistence hunters take caribou as the herds migrate. It is the land for berry picking, goose hunting, and fishing. Stewardship of the natural arctic environment to preserve traditional Iñupiaq subsistence activities as well as for its value as a unique ecosystem is essential to residents.

Objective 1: Seek a healthy arctic environment through leadership in land use and wildlife management.

Implementing Strategies

10.1.1. Coordinate with resource agencies to identify and map watersheds, wetlands, and traditional trails in the North Slope Borough that are important for subsistence.

10.1.2. Evaluate existing zoning and land use regulations for effectiveness in protecting sensitive areas, including establishing a zoning district(s) specifically for subsistence and/or special habitats.

10.1.3. Develop a wetlands mitigation bank that compensates for expected adverse impacts to the environment.

Objective 2: Identify, remediate, and remove contamination and hazardous waste.

Implementing Strategies

10.2.1. Identify existing and abandoned sites with garbage, hazardous waste, and toxic substances and seek funds for demolition and clean-up.

10.2.2. Educate village residents about proper disposal of garbage, hazardous waste, and toxic substances.

10.2.3. Enforce existing laws and policies to prevent future contamination.

10.2.4. Develop a system for the export of hazardous and other non-disposable material.

Goal 10. Protect our environment.
Education

The population of young residents has been outpacing growth of the labor force. This steady increase in young people is anticipated to continue to increase over the next twenty years. Additional resources will be needed to provide services, education and training, and educational facilities for this population in the coming years.

**Goal 11.** Increase education and employment opportunities for all residents.

**Objective 1: Evaluate educational and training needs of the unemployed.**

*Implementing Strategies*

11.1.1. Determine needs of current and future employers and design education and training programs to target programs to these employment needs.

**Objective 2: Develop an areawide education plan for primary, secondary, and higher education with a focus on graduate retention in our communities.**

*Implementing Strategies*

11.2.1. Focus resources on the burgeoning youth population to provide sufficient services.

11.2.2. Maintain and increase coordination between NSBSD and Iḷisaġvik to offer workforce training programs at the high school level.

11.2.3. Develop internships, apprenticeships, on-the-job training, and student hire programs through NSBSD, NSB, ASNA, ASRC, village corporations, TNHA, industry, and other local and regional agencies and entities.

11.2.4. Continue developing daycare centers in the villages to offer a strong academic foundation through pre-kindergarten education.

11.2.5. Create or strengthen programs to train future teachers from within the community.

11.2.6. Research causes for the high teacher turnover and seek programmatic solutions and funding, if necessary.
11.2.7. Educate parents on the importance of parental involvement in their children’s academic achievements and offer ample opportunities to volunteer in the classroom or assisting outside the classroom.

11.2.8. Assess village training program and education quality equity and adjust as needed.

Objective 3: Evaluate future capital needs to meet educational demand.

Implementing Strategies

11.3.1. Assist Iḷisaġvik College in seeking funding to construct a new facility in Utqiaġvik to better meet their needs.

11.3.2. Assess village educational space equity and future needs and plan accordingly.

11.3.3. Improve Native language fluency through partial or full immersion programs from pre-kindergarten through high school.

11.3.4. Seek funding and opportunities to assist fluent Iñupiaq speakers to become certified teachers.

11.3.5. Encourage the North Slope Borough School District and educators to further incorporate traditional and cultural values throughout the school curricula.

11.3.6. Integrate Elders into school activities through shared lunches, invitations to speak with classes, and involvement in student projects.

11.3.7. Teach traditional values to new generations by highlighting local success stories and how traditional and cultural values assisted in their success.
Access to recreational activities, healthy foods, and physical and mental health programs all foster an improved quality of life. The North Slope Borough is often the sponsor of activities, initiatives, and programs throughout the borough aimed at increasing healthy living and wellness as well as providing addiction treatment assistance and programs for residents with mental or physical disabilities. NSB also provides capital and operational funding for health-related facilities. As the elderly population continues to increase, providing an adequate continuum of care will become more important.

**Objective 1: Foster a healthy lifestyle for all residents.**

**Implementing Strategies**

- **12.1.1.** Seek increased access to recreational facilities in the villages, especially at the schools, to promote physical activity.

- **12.1.2.** Continue to encourage healthy living and fitness through the Healthy Communities Initiative and other programs.

- **12.1.3.** Collaborate with local Tribes, city governments, and corporations to offer entertainment and activities, such as movie nights, sports, and clubs.

- **12.1.4.** Continue to provide treatment assistance for those with addiction issues.

- **12.1.5.** Educate residents on the importance of fitness and a well-balanced diet for longevity and overall quality of health.

**Objective 2: Evaluate existing programs and seek improvements and consolidation where possible.**

**Implementing Strategies**

- **12.2.1.** Investigate the feasibility and potential cost savings of consolidating health and social services offered by Health Department and ASNA.

- **12.2.2.** Evaluate ways to train homegrown health professionals and address current turnover and burnout.

- **12.2.3.** Promote and incentivize preventative programs.
12.2.4. Establish an environmental health division or department to coordinate with industry and residents.

12.2.5. Seek improved coordination of care with local health care providers in Anaktuvuk Pass and Point Hope.

12.2.6. Promote and incentivize volunteerism.

12.2.7. Expand health care services through telemedicine.

12.2.8. Creation of a health consortium.

12.2.9. Evaluate current programs aimed and preventing and treating drug and alcohol abuse for effectiveness and implementation of best practices.

12.2.10. Provide education on the effective of cyber bullying and constant stimulation of technology.

Objective 3: Evaluate capital needs to accommodate program improvements.

Implementing Strategies

12.3.1. Seek funding for a regional detoxification facility.

12.3.2. Seek funds for a hospice facility.

12.3.3. Evaluate the need for a crisis center for men and the space needs for Arctic Women in Crisis.

12.3.4. Establish a regional training center for police and fire protection.

12.3.5. Coordinate with local search and rescue organizations to identify and facilitate facility space needs.

12.3.6. Evaluate the need for renovations and expansion of health clinics.

Objective 4: Evaluate needs of elderly population.

Implementing Strategies

12.4.1. Focus resources on providing for the aging population as this group increases.

12.4.2. Create a hospice care program in all the villages.
Effective Government

The North Slope Borough has responsibilities for a wide range of services and programs that directly affect residents’ quality of life. The government must continue to be accountable and efficient to provide these services in a cost effective manner while staying consistent with the borough’s founders’ vision for the people, land, and resources.

**Objective 1: Reevaluate state and federal obligations in community health, social services, and security.**

**Implementing Strategies**

13.1.1. Keep up with advancement of technology.

13.1.2. Pursue funding from Bureau of Indian Affairs, State of Alaska, Denali Commission, Housing and Urban Development, and federal transportation funds for housing and transportation needs.

13.1.3. Continue effective hazard planning to protect the North Slope community and subsistence resources from natural disasters.

**Objective 2: Rediscover our founders’ intent as a home rule borough.**

**Implementing Strategies**

13.2.1. Measure government performance and make information available to the public.

13.2.2. Focus on consistent and effective enforcement of borough laws and regulations.

13.2.3. Review options to ensure that local resources are deployed in the most cost effective manner to help achieve the community’s vision and goals for the future.
PLAN UPDATES AND REVISIONS

The North Slope Borough Comprehensive Plan is intended to be a living document. Because situations change, the goals, objectives, and strategies in this chapter should be updated to reflect current priorities and opportunities. The borough may wish to update the tables each year as part of developing an annual work plan and priorities for capital projects.

This plan is a guide that provides direction for the village leadership when collaborating with NSB, state, and federal agencies, and other organizations. For example, individual land use proposals can be evaluated against the future land use maps. Such proposals may include a residential subdivision, transportation projects, recreational facilities, sanitation facilities, or other infrastructure. The designations in the future land use maps can also be reviewed when Title 19 is updated to determine if amendments are warranted to the types of zoning districts and the actual designations on the official zoning map. Generally, comprehensive plans have a 20-year planning horizon, and ideally, they are reviewed every two years for potential updates and updated as a matter of procedure every five years. Regularly updating the goals, objectives, and strategies will make it easier to complete the next update of the entire plan.
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Appendices

Appendix A: NSB Assembly Ordinance
   NSB Planning Commission Resolution

Appendix B: Comprehensive Planning Outreach
   Arctic Sounder Advertisement
   Comment Period Flyer

Appendix C: Barrow High School Student Council Planning Discussion Notes

Appendix D: Public Facilities Capacities and Forecasts

Appendix E: Adaption Strategies for Climate Change Impacts

Appendix F: Public Review Comments
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NORTH SLOPE BOROUGH
ORDINANCE SERIAL NO. 75-06-73

A ORDINANCE ADOPTING THE
NORTH SLOPE BOROUGH COMPREHENSIVE PLAN

WHEREAS, the Planning Commission is charged under North Slope Borough Municipal Code of Ordinances (NSBMC) §2.12.160(A)(1) with the responsibility to prepare and recommend to the Assembly a Comprehensive Plan (Plan) for the systematic development of the Borough; and

WHEREAS, under NSBMC §2.12.160(A)(2), the Planning Commission is charged with preparing and recommending to the Assembly a zoning ordinance to implement the North Slope Borough Comprehensive Plan; and

WHEREAS, under NSBMC § 2.12.170(A) the Plan shall be a compilation of policy statements, goals, standards and maps for guiding the physical, social and economic development, both private and public of the Borough; and

WHEREAS, the Planning Commission is further charged under NSBMC §2.12.170(C) to consider recommendations based upon workshops to be held in each North Slope Borough Community with the respective city council and Borough staff before presenting recommendations to the Assembly; and

WHEREAS, the Plan was developed with public involvement, including meetings in every community with leadership, public meetings in every community, and solicitation for comments; and

WHEREAS, the Plan is a compilation of policy statements, goals, standards and maps for guiding the physical, social and economic development, both private and public of the Borough which is based on recommendations from every community.

WHEREAS, the Planning Commission adopted Resolution 2019-01 on January 31, 2019, recommending the Assembly approve of the Plan; and

WHEREAS, the North Slope Borough Comprehensive Plan is found to be a sufficient guide to future development for the region over the next 20 years.

NOW, THEREFORE, BE IT ENACTED:

SECTION 1. Classification. This ordinance is a non-code ordinance.

SECTION 2. Severability. If any provision of this ordinance or any application thereof to any person or circumstance is held invalid, the remainder of this ordinance and the
Ordinance Serial No 75-06-73
Page 2 of 2

application to other persons and circumstances shall not be affected thereby.

SECTION 3. Effectiveness. This code ordinance shall become effective upon adoption.

SECTION 4. Adoption of North Slope Borough Comprehensive Plan. The North Slope Borough Assembly hereby adopts the North Slope Borough Comprehensive Plan, attached as Exhibit B, as recommended by the North Slope Borough Planning Commission.


INTRODUCED: February 5, 2019
ADOPTED: March 5, 2019

John Hopson, Jr., President
Date: 3·5·19

ATTEST:
Sheila Burke, Borough Clerk
Date: 3·5·19

Harry K. Brower, Mayor
Date: 3·5·19
North Slope Borough Planning Commission Resolution

Exhibit A

NORTH SLOPE BOROUGH PLANNING COMMISSION
RESOLUTION 2019-01

A RESOLUTION RECOMMENDING TO THE
ASSEMBLY APPROVAL OF THE NORTH SLOPE
BOROUGH COMPREHENSIVE PLAN

WHEREAS, the Planning Commission is charged under North Slope Borough Municipal Code (NSBMC) § 2.12.160(A)(1) with the responsibility to prepare and recommend to the Assembly a Comprehensive Plan (Plan) consisting of maps and related texts for the systematic development of the Borough; and

WHEREAS, under NSBMC § 2.12.170(A) the Plan shall be a compilation of policy statements, goals, standards and maps for guiding the physical, social and economic development, both private and public of the Borough; and

WHEREAS, the Plan was developed with public involvement, including meetings in every community with leadership, public meetings in every community, and solicitation for comments; and

WHEREAS, the Plan is a compilation of policy statements, goals, standards and maps for guiding the physical, social and economic development, both private and public of the Borough which is based on recommendations from every community.

NOW, THEREFORE, BE IT RESOLVED THAT:

The North Slope Borough Planning Commission recommends to the North Slope Borough Mayor and the North Slope Borough Assembly the approval of the North Slope Borough Comprehensive Plan.

THAT a copy of this Resolution be forwarded to the North Slope Borough Clerk.

INTRODUCED: 1/31/19
ADOPTED: __________________________

Caroline Cannon, Clerk
Date: 1/31/19

Paul Bodfish Sr., Chairman
Date: 01-31-2019
Appendix B: Comprehensive Planning Outreach

**Community Meetings!**
North Slope Borough Comprehensive Plan &
Arctic Strategic Transportation and Resources (ASTAR)

Village comprehensive plans have been created for all North Slope communities. The Borough is now focusing on developing an updated Comprehensive Plan for the region with a renewed vision for the future and goals, objectives, and implementing strategies that will guide the borough over the next 20 years and beyond!

ASTAR seeks to identify regional infrastructure needs through alliances with communities and stakeholders and collaboration opportunities which strengthen community infrastructure and facilitate access to Arctic resources. A strategic plan will prioritize community needs and then looks to identify infrastructure opportunities that offer the most cumulative benefit. The ASTAR effort will gather regional information through community scoping, data analysis of existing data, and field studies.

- **Kaktovik**
  - Monday October 1st
  - 6pm
  - City Hall

- **Nuiqsut**
  - Tuesday October 2nd
  - 6pm
  - Trapper School

- **Walnwright**
  - Wednesday October 3rd
  - 6pm
  - City Hall

- **Anaktuvuk Pass**
  - Thursday October 4th
  - 6pm
  - City Hall

- **Atqasuk**
  - Wednesday October 10th
  - 6pm
  - Meade River School

- **Point Lay**
  - Thursday October 11th
  - 6pm
  - Community Center

- **Point Hope (rescheduled)**
  - Tuesday, October 23rd
  - 6pm
  - City Hall Galig

Dinner and door prizes will be provided!

---

**Utqiagvik Community Meeting!**
North Slope Borough Comprehensive Plan &
Arctic Strategic Transportation and Resources (ASTAR)

**Wednesday, December 5th, 6pm**
Inupiat Heritage Center

Village comprehensive plans have been created for all North Slope communities. The Borough is now focusing on developing an updated Comprehensive Plan for the region with a renewed vision for the future and goals, objectives, and implementing strategies that will guide the borough over the next 20 years and beyond!

ASTAR seeks to identify regional infrastructure needs through alliances with communities and stakeholders and collaboration opportunities which strengthen community infrastructure and facilitate access to Arctic resources. A strategic plan will prioritize community needs and then looks to identify infrastructure opportunities that offer the most cumulative benefit. The ASTAR effort will gather regional information through community scoping, data analysis of existing data, and field studies.
NOTICE TO CREDITORS
IN THE SUPERIOR COURT FOR THE STATE OF ALASKA, SECOND JUDICIAL DISTRICT, IN UNGADOR
IN THE MATTER OF THE ESTATE OF
[Name of Deceased]
Somewhere.
Docket No. [Docket No.]
Case No. [Case No.]
NOTICE TO CREDITORS
You are notified that [Name of Executor/Administrator] has been appointed Personal Representative of this estate. All persons having claims against the decedent are requested to present their claims within four months after the date of the first publication of this notice to avoid loss of any rights that the estate may have against them.
[Executor/Administrator]
[Address]
[Date]

PUBLIC NOTICE
North Slope Borough
Planning and Community Services Department
Station Three, Chevak
[Contact Information]
[Phone Number]
REQUEST FOR PUBLIC COMMENT ON THE NORTH SLOPE BOROUGH COMPREHENSIVE PLAN UPDATE
The North Slope Borough Planning and Community Services Department invites comments on the draft 2019 North Slope Borough Comprehensive Plan. The draft plan will be available for review at the North Slope Borough Planning and Community Services Department and online. The draft plan is also available on the Borough website: [Website Link].
For questions or to provide comments, please contact [Name], Planning and Community Services Department, at [Phone Number]

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Appendix C: Barrow High School Student Government SWOT Workshop

Barrow High School Student Government
Strengths, Weakness, Opportunities, Threats Workshop
April 24, 2018

A strengths, weaknesses, opportunities, and threats (SWOT) session was conducted on April 24, 2018 with nine Barrow High School students. The SWOT session was part of an outreach effort that the North Slope Borough Comprehensive Plan update process. Twelve students (9th-12th grade) from the Student Government participated in the hour long session as volunteers. Students had been previously briefed by the Student Government advisor about SWOTs and the process and were prepared to give feedback.

Strengths:
- Many opportunities within the community
- Designated adults to talk to (designated counselor)
- Range of good technology available (laptops given to students to use for school)
- Funding for NSBSD
- Small class sizes
- Drug/alcohol awareness
- Free breakfast and lunch
- Highly accessible school board
- Dual credit with Iḷisaġvik

Weaknesses:
- Lack of college readiness
- Infrastructure is old
- High percentage of teacher turnover
- New teachers (versus having stable and predictable teachers, e.g. Mr. Smith has taught 10th grade Geography for 20 years)
- Lack of variation in programs available to students (no educational clubs)
- Too sports driven
- Start time is too late and interferes with extra-curricular activities
- Social stratifications/Cliques (social atmosphere is in/out context)
- Lack of student involvement (not many students get involved in activities)
- Lack of communication with other schools within the district
- Too spiritual/need to separate religion from school-wide events
- Lack of advanced classes
- No programs for college readiness (no advanced placement courses offered)
Opportunities:
- Renovated hospital provides jobs (newer facility more inviting to work)
- State officials advocating on behalf of NSBSD
- Oil and gas funding increase
- MYAC/ AASG/ RAHI (student programs outside the district)
- Dual-credit with Ilisaġvik
- Sports (provides opportunities outside school district realm)
- Student internships
- Ilisaġvik summer camps
- Bridge program
- Local corporate donations to programs
- Strong connection to UA system

Threats:
- Lack of gun safety- no protocol
- Drug and alcohol abuse in community
- Oil is not sustainable
- Climate change/animal endangerment
- Slow progress of technology on North Slope (technology available to students)
- Not enough investment into educational programs/clubs
- Racial discrimination
- Low standards in NSBSD/low expectations from NSBSD is bringing those who work hard down
- Coastal erosion
- Lack of access to mental health services
- Easy access to drugs and alcohol/easy to import drugs and alcohol
- Low diversity in types of clubs to join
- U.S. Department of Education Secretary (Betsy DeVos’ plan for public education is a perceived threat)
- Global war
- Diseases/viruses
- Not fostering a love of education in young students
Appendix D: Public Facilities Capacities and Forecasts

Table 40: Water Generation, Treatment Capacity, and Forecast\textsuperscript{392, 393}

<table>
<thead>
<tr>
<th>Village</th>
<th>Provider</th>
<th>Source</th>
<th>Treatment Method</th>
<th>Treatment Capacity (gallons per day)</th>
<th>Storage Capacity</th>
<th>Delivery Method</th>
<th>Projected High Annual Demand for Plan Period</th>
<th>Comments</th>
<th>Recommended Upgrades</th>
<th>Funded Upgrades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>NSB</td>
<td>Well</td>
<td>chlorine treatment</td>
<td>50,000 gpd (year round)</td>
<td>300,000 gallons</td>
<td>UG Pipe</td>
<td>6.5 mil gallons</td>
<td>adequate for service through plan period</td>
<td>Needs a secondary groundwater source &amp; secondary water storage tank to ensure continued water supply.</td>
<td>2nd well funded 2018</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>NSB</td>
<td>Fresh Water Lake</td>
<td>filtration</td>
<td>93,000 gpd (seasonal)</td>
<td>4 mil gallons</td>
<td>UG Pipe</td>
<td>4 mil gallons</td>
<td>adequate for service through plan period</td>
<td>Need UG piping expansion for adding homes to existing piping.</td>
<td>None</td>
</tr>
<tr>
<td>Utqiaġvik</td>
<td>BUECI</td>
<td>Fresh Water Lake</td>
<td>filtration</td>
<td>345,000 gpd (year round)</td>
<td>1.5 mil gallons</td>
<td>UG Pipe, Utilidor</td>
<td>127 mil gallons**</td>
<td>adequate for service through plan period</td>
<td>Recommendation to upgrade transit building / SCADA / expansion to College</td>
<td>SCADA upgrades design funded</td>
</tr>
<tr>
<td>Kaktovik</td>
<td>NSB</td>
<td>Fresh Water Lake</td>
<td>filtration</td>
<td>93,000 gpd (seasonal)</td>
<td>3.5 mil gallons</td>
<td>UG Pipe</td>
<td>5 mil gallons</td>
<td>Looking at raw water well installation.</td>
<td>need upgrades to, or replacement of storage tanks so that they have 5 million - or need well for year round source</td>
<td>None</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>NSB</td>
<td>Fresh Water Lake</td>
<td>filtration</td>
<td>200,000 gpd (seasonal)</td>
<td>7.8 mil gallons</td>
<td>UG Pipe</td>
<td>7.2 mil gallons</td>
<td>Adequate through plan period. Need to demolish old unused water tank.</td>
<td>Need UG piping expansion for adding homes.</td>
<td>UG piping designed, currently not funded for construction</td>
</tr>
<tr>
<td>Point Hope</td>
<td>NSB</td>
<td>Fresh Water Lake</td>
<td>filtration</td>
<td>200,000 gpd (seasonal)</td>
<td>9.6 mil gallons</td>
<td>UG Pipe</td>
<td>11.4 mil gallons</td>
<td>Fresh water source is diminishing. NSB looking at raw water wells.</td>
<td>The water storage capability should be expanded by 2 million gallons and/or provide year round well(s).</td>
<td>none</td>
</tr>
</tbody>
</table>

\textsuperscript{392} Corkrean, Paul. Waste Water Level III. UIC Lands, LLC. Personnel communication.
\textsuperscript{393} Holmes, Travis. Principal Engineer. UMIAQ Design & Municipal Services. Personal communication.
<table>
<thead>
<tr>
<th>Village</th>
<th>Provider</th>
<th>Source</th>
<th>Treatment Method</th>
<th>Treatment Capacity (gallons per day)</th>
<th>Storage Capacity</th>
<th>Delivery Method</th>
<th>Projected High Annual Demand for Plan Period</th>
<th>Comments</th>
<th>Recommended Upgrades</th>
<th>Funded Upgrades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Point Lay</td>
<td>NSB</td>
<td>River</td>
<td>filtration / RO</td>
<td>93,000 gpd (seasonal)</td>
<td>4.7 mil gallons</td>
<td>UG Pipe</td>
<td>4.3 million gallons</td>
<td>Kokolik River provides village water, using a reverse osmosis treatment. Oldest water storage tank is approaching the end of its useful life. Often exceeds discharge parameters.</td>
<td>The NSB seeks to develop a new water source. Need repairs to fix line breaks and leaks.</td>
<td>System upgrades master plan funding in place - wells are feasible; need construction funding</td>
</tr>
<tr>
<td>Wainwright</td>
<td>NSB</td>
<td>WWTP &amp; sewage lagoon</td>
<td>28,000 gpd</td>
<td></td>
<td>UG gravity main</td>
<td>Truck haul &amp; honey bucket</td>
<td>40,400 gal/day</td>
<td>Often exceeds discharge parameters often</td>
<td>Water storage capability should be expanded by 2 million gallons, and/or year round well(s). The water treatment facility should be updated or replaced, as it is currently past its useful life</td>
<td>Water plant building design is complete; construction not funded</td>
</tr>
</tbody>
</table>

* Based on population projected to end of plan period X 35 gpd/person daily average X 365 (excluding Utqiagvik)

** Based on population projected to end of plan period X 53 gpd/person daily average X 365
### Table 41: Wastewater and Sewage Treatment, Capacity, and Forecast

<table>
<thead>
<tr>
<th>Village</th>
<th>Provider</th>
<th>Treatment Method</th>
<th>Treatment Capacity</th>
<th>Delivery Method</th>
<th>*Projected Avg Peak Demand</th>
<th>Comments</th>
<th>Required Upgrades</th>
<th>Funded Upgrades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk</td>
<td>NSB</td>
<td>WWTP &amp; Sewage lagoon</td>
<td>20,000 gallons per day</td>
<td>UG gravity main</td>
<td>27,667 gallons per day</td>
<td>Lagoons and treatment plant were upgraded and now have adequate capacity</td>
<td>If expansion of Poker Hill subdivision takes place, UG system will need expansion</td>
<td></td>
</tr>
<tr>
<td>Atqasuk</td>
<td>NSB</td>
<td>WWTP &amp; sewage lagoon</td>
<td>11,000 gallons per day</td>
<td>UG vacuum man</td>
<td>17,460 gallons per day</td>
<td>Exceeds discharge parameters often The WWTP is undersized and will require upgrading to substantially increase the current treatment capacity.</td>
<td>Needs upgrades to treatment system and expansion of UG piping for additional homes. The vacuum main pipeline system will need to be expanded when connecting additional homes.</td>
<td>Design complete for home expansion pending construction funding</td>
</tr>
<tr>
<td>Utqiagvik</td>
<td>BUECI</td>
<td>WWTP</td>
<td>108 mil gallons per day</td>
<td>UG forced main &amp; utilidor</td>
<td>536,283 gallons per day**</td>
<td>Treatment plant can double capacity / lagoon available for back up</td>
<td>Parallel treatment trains as needed to meet capacity, Upgrade PS 5.</td>
<td>None</td>
</tr>
<tr>
<td>Kaktovik</td>
<td>NSB</td>
<td>WWTP &amp; two cell Sewage lagoon</td>
<td>11,000 gallons per day</td>
<td>UG pipe vacuum main</td>
<td>22,790 gallons per day</td>
<td>Exceeds discharge parameters often</td>
<td>Needs upgrades to treatment system / need upgrades to effluent outfall.</td>
<td>Working on pilot project for fixed media upgrades to plant. Projected 40% increase in treatment capacity[^394]</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>NSB</td>
<td>WWTP &amp; sewage lagoon</td>
<td>28,000 gallons per day</td>
<td>UG pipe vacuum main</td>
<td>31,680 gallons per day</td>
<td></td>
<td>Expansion of UG piping for additional homes</td>
<td>Design complete for home expansion pending construction funding</td>
</tr>
<tr>
<td>Village</td>
<td>Provider</td>
<td>Treatment Method</td>
<td>Treatment Capacity</td>
<td>Delivery Method</td>
<td>*Projected Avg Peak Demand</td>
<td>Comments</td>
<td>Required Upgrades</td>
<td>Funded Upgrades</td>
</tr>
<tr>
<td>---------------</td>
<td>----------</td>
<td>-----------------------------------</td>
<td>--------------------</td>
<td>-----------------</td>
<td>----------------------------</td>
<td>--------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------</td>
<td>------------------------------------------------</td>
</tr>
<tr>
<td>Point Hope</td>
<td>NSB</td>
<td>WWTP &amp; sewage lagoon</td>
<td>28,000 gallons per day</td>
<td>UG vacuum main</td>
<td>Truck haul &amp; honey bucket</td>
<td>50,000 gallons per day</td>
<td>Exceeds discharge parameters often / vac system recently upgraded</td>
<td>Expansion of UG piping for proposed NE subdivision</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>wastewater plant upgrade funded - pending results of Kaktovik pilot</td>
</tr>
<tr>
<td>Point Lay</td>
<td>NSB</td>
<td>WWTP &amp; sewage trench</td>
<td>11,000 gallons per day</td>
<td>UG gravity main</td>
<td>Truck haul &amp; honey bucket</td>
<td>18,938 gallons per day</td>
<td>Exceeds discharge parameters often</td>
<td>Need repairs to fix line breaks and leaks / need upgrades to sewage lagoon</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Project to add truck haul and honey buckets to WWTP is under design, construction funding expected 2018 / lagoon upgrades funded</td>
</tr>
<tr>
<td>Wainwright</td>
<td>NSB</td>
<td>WWTP &amp; sewage lagoon</td>
<td>28,000 gallons per day</td>
<td>UG gravity main</td>
<td>Truck haul &amp; honey bucket</td>
<td>40,400 gallons per day</td>
<td>Exceeds discharge parameters often</td>
<td>Needs upgrades to treatment system</td>
</tr>
</tbody>
</table>

* Based on projected population for plan period (high growth rate) X 35 gpd/persons X 1.6 peaking factor: Assumes all population on system

**Based on projected population for plan period (high growth rate) X 51 gpd/persons X 1.6 peaking factor: Assumes all population on system
### Table 42: Landfill and Sewage Lagoon Capacity and Forecast

<table>
<thead>
<tr>
<th>Village</th>
<th>Provider</th>
<th>Class</th>
<th>Configuration</th>
<th>Sewage / Solid Waste</th>
<th>Adequacy of Sewage Lagoon</th>
<th>Adequacy of Landfill</th>
<th>Comments</th>
<th>Required Upgrades</th>
<th>Funded Upgrades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>NSB</td>
<td>III</td>
<td>3 - lagoon</td>
<td>1 - Cells 1 - Burncage</td>
<td>Newly expanded &amp; projected to be adequate through plan period</td>
<td>Currently undersized. Anticipate landfill to be full in 2035+/-</td>
<td>Landfill needs expansion</td>
<td>New sewage lagoons completed</td>
<td></td>
</tr>
<tr>
<td>Atqasuk</td>
<td>NSB</td>
<td>III</td>
<td>1 - lagoon</td>
<td>1 - Cell 1 - Burncage</td>
<td>Adequate through plan period. Regulatory non-compliant for primary and secondary cell</td>
<td>Adequate through plan period</td>
<td>Lagoon needs partition into two cells to be compliant with ADEC regulations</td>
<td>Lagoon partition funded, pending design</td>
<td></td>
</tr>
<tr>
<td>Utqiagvik</td>
<td>NSB</td>
<td>II</td>
<td>N/A</td>
<td>3 - Cells 1 - TOS</td>
<td>N/A - Emergency back-up use only</td>
<td>Currently undersized for plan period**</td>
<td>Landfill needs cell 4 completed</td>
<td>Cell 4 expansion funds expected in 2018</td>
<td></td>
</tr>
<tr>
<td>Kaktovik</td>
<td>NSB</td>
<td>III</td>
<td>2 - lagoons</td>
<td>1 - Cell 1 - Burncage</td>
<td>Potentially adequate</td>
<td>Adequate through plan period</td>
<td>Snow melt threatens lagoon an uncontrolled and untreated onto tundra</td>
<td>Lagoon needs snow management configuration change with routine snow drift removal throughout winter and spring melt</td>
<td>Ongoing funding potential with airport project</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>NSB</td>
<td>III</td>
<td>1 - Lagoon</td>
<td>3 - Cells 1 - Burncage</td>
<td>Adequate through plan period. Regulatory non-compliant for primary and secondary cell</td>
<td>Adequate through plan period**</td>
<td>Lagoon needs partition into two cells</td>
<td>Lagoon partition funding expected 2018</td>
<td></td>
</tr>
<tr>
<td>Point Hope</td>
<td>NSB</td>
<td>III</td>
<td>Perc pit</td>
<td>1 – Cell 1 - Burncage</td>
<td>Adequate through plan period</td>
<td>Adequate through plan period</td>
<td>Landfill needs vertical expansion</td>
<td>New sewage lagoon funded</td>
<td></td>
</tr>
<tr>
<td>Point Lay</td>
<td>NSB</td>
<td>III</td>
<td>1 - Trench</td>
<td>3 - Cells 1 - Burncage</td>
<td>currently non-compliant</td>
<td>Adequate through plan period</td>
<td>An area has been designated for lagoon</td>
<td>Need lagoon</td>
<td>New sewage lagoon funded</td>
</tr>
<tr>
<td>Wainwright</td>
<td>NSB</td>
<td>III</td>
<td>2 - lagoons</td>
<td>1 - Cell 1 - Burncage</td>
<td>Adequate through plan period</td>
<td>Remaining life through 2021</td>
<td>Greywater lagoon at capacity routinely due to annual melt water</td>
<td>Close gray water lagoon / increase landfill capacity</td>
<td>Landfill expansion under design</td>
</tr>
</tbody>
</table>

* Based on UMQIAQ Design & Municipal Services forecasted landfill life from Areawide Landfill Re-permitting, 9/12/2017

**Per UMQIAQ Design & Municipal Services and NSB staff discussions
# Table 43: Power Generation and Demand Forecast

<table>
<thead>
<tr>
<th>Village</th>
<th>Provider</th>
<th>Source</th>
<th>Demand Capacity</th>
<th>2040 Projected High Average Demand</th>
<th>2040 Projected High Peak Demand</th>
<th>Comments</th>
<th>Required Upgrades</th>
<th>Funded Upgrades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>NSB</td>
<td>Diesel Gen</td>
<td>1,900kW</td>
<td>672kW</td>
<td>864kW</td>
<td>Needs expansion for cooling capacity</td>
<td>Design for expansion</td>
<td></td>
</tr>
<tr>
<td>Atqasuk</td>
<td>NSB</td>
<td>Diesel Gen</td>
<td>3,245kW</td>
<td>606kW</td>
<td>667kW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utqiaġvik</td>
<td>NSB</td>
<td>Natural Gas Gen</td>
<td>20.5mW</td>
<td>12mW</td>
<td>12mW</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kaktovik</td>
<td>NSB</td>
<td>Diesel Gen</td>
<td>2670kW</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Needs expansion for cooling capacity</td>
<td>Expansion currently under construction</td>
<td></td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>NSB</td>
<td>Natural Gas &amp; Diesel Gen</td>
<td>2,095kW NG / 2,270kW diesel</td>
<td>Unknown</td>
<td>Unknown</td>
<td>Needs expansion for cooling capacity</td>
<td>Construction funding expected 2018</td>
<td></td>
</tr>
<tr>
<td>Point Hope</td>
<td>NSB</td>
<td>Diesel Gen</td>
<td>2,915kW</td>
<td>955kW</td>
<td>1128kW</td>
<td>Recently upgraded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Point Lay</td>
<td>NSB</td>
<td>Diesel Gen</td>
<td>2,532kW</td>
<td>656kW</td>
<td>955kW</td>
<td>Recently upgraded</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wainwright</td>
<td>NSB</td>
<td>Diesel Gen</td>
<td>1,900 kW</td>
<td>1,182kW</td>
<td>1,478kW</td>
<td>Existing power plan is old</td>
<td>Needs replacement</td>
<td></td>
</tr>
</tbody>
</table>
Table 44: Snow Fence Forecast

<table>
<thead>
<tr>
<th>Village</th>
<th>Snow Fence Systems Currently in Use</th>
<th>*Location</th>
<th>*Recommended Upgrades</th>
<th>Funded Upgrades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>3</td>
<td>1 north of town, 2 at landfill</td>
<td>2011 PAR recommends snow fences added at various locations</td>
<td>Design for expansion</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>10</td>
<td>All east of town</td>
<td>2011 PAR recommends snow fences added to airstrip and apron</td>
<td></td>
</tr>
<tr>
<td>Utqiagvik</td>
<td>multiple</td>
<td>Gas fields, Cakeeater road, fresh water lake, TOS, east of town, east of Browerville, and at NARL</td>
<td>2011 PAR recommends snow fences added at gas fields and various locations</td>
<td></td>
</tr>
<tr>
<td>Kaktovik</td>
<td>8</td>
<td>East and west sides of town</td>
<td>2011 PAR recommends snow fences added at infrastructure locations outside of town, particularly landfill, lagoon and airport</td>
<td>Expansion currently under construction</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>none</td>
<td></td>
<td>2011 PAR recommends snow fences added at infrastructure locations outside of town, particularly landfill road and airport</td>
<td>Construction funding expected 2018</td>
</tr>
<tr>
<td>Point Hope</td>
<td>2</td>
<td>North of town</td>
<td>2011 PAR recommends snow fences added at southside of town, and north of tank farm</td>
<td></td>
</tr>
<tr>
<td>Point Lay</td>
<td>3</td>
<td>East of town, landfill</td>
<td>2011 PAR recommends snow fences added at edges of town, and at landfill</td>
<td></td>
</tr>
<tr>
<td>Wainwright</td>
<td>8</td>
<td>North and east of town, tank farm, and apron</td>
<td>2011 PAR recommends snow fences added at landfill and southwest side of town</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Village</th>
<th>Provider</th>
<th>Source</th>
<th>Currently Stockpiled</th>
<th>Available in Situ</th>
<th>*Projected Demand Through Plan Period</th>
<th>Comments</th>
<th>Required Upgrades</th>
<th>Funded Upgrades</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk</td>
<td>Nunamiut Corp / NSB</td>
<td>Nunamiut Corp land</td>
<td>minimal</td>
<td>More than adequate through plan period</td>
<td>Maintenance -4,200 cy/year Projects - unknown</td>
<td>Rock crusher sent this spring - need lease for stockpile area</td>
<td>Need new contract with local village corp / need new crusher</td>
<td>$2.7mil for crusher and stockpiling</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>NSB</td>
<td>Utqiagvik</td>
<td>3,500 cy less recent usage</td>
<td>Unknown</td>
<td>Maintenance -2,000 cy/year Projects - unknown</td>
<td>Currently looking for local source / 3500 cu yds. delivered from BRW in 2017</td>
<td>Need local source</td>
<td>3,500 cy delivered</td>
</tr>
<tr>
<td>Utqiagvik</td>
<td>SKW / UIC</td>
<td>Local pits</td>
<td>Unknown</td>
<td>Maintenance -6,000 cy/year Projects - unknown</td>
<td>Airport contractor provided approx. 63,000 cy</td>
<td>Need better local material sources</td>
<td>Airport contractor to mine and place 75,000 cy - ultimately 63,000 cy</td>
<td></td>
</tr>
<tr>
<td>Kaktovik</td>
<td>ASRC site</td>
<td>Airport upgrade job</td>
<td>63,000 cy less recent usage</td>
<td>Unknown</td>
<td>Maintenance -6,000 cy/year Projects - unknown</td>
<td>Need better local material sources</td>
<td>Airport contractor to mine and place 75,000 cy - ultimately 63,000 cy</td>
<td></td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>NSB / Kuukpik</td>
<td>Local pits</td>
<td>140,000 cy less current usage - see comment</td>
<td>adequate supply nearby through plan period</td>
<td>Maintenance -500 cy/year Projects - unknown</td>
<td>65,600 cy dedicated to Colville River Rd</td>
<td>Need local source / investigate new local source near landfill</td>
<td></td>
</tr>
<tr>
<td>Point Hope</td>
<td>NSB</td>
<td>Barge</td>
<td>Unknown</td>
<td>Maintenance -520 cy/year Projects -</td>
<td>Potential new source recently discovered next to landfill</td>
<td>Need local source / investigate new local source near landfill</td>
<td>Need local source</td>
<td></td>
</tr>
<tr>
<td>Point Lay</td>
<td></td>
<td></td>
<td>100,000 cy (est)</td>
<td>Maintenance -3,000 cy/year Projects -</td>
<td></td>
<td>Need local source</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wainwright</td>
<td>NSB/OC</td>
<td>NSB - stockpile</td>
<td>17,000 cy or less</td>
<td>400,000 cy (est)</td>
<td>Maintenance -1,300 cy/year Projects -</td>
<td></td>
<td>Local source needs development</td>
<td></td>
</tr>
</tbody>
</table>
Table 46: Energy Availability and Supply\(^{399}\)

<table>
<thead>
<tr>
<th>Village</th>
<th>Provider</th>
<th>Diesel Capacity*</th>
<th>Jet A Capacity*</th>
<th>Gasoline Capacity*</th>
<th>Delivery Method - Diesel &amp; Gas</th>
<th>Natural Gas Capacity</th>
<th>Delivery Method - Natural Gas</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>NSB</td>
<td>181,000 gal</td>
<td>N/A</td>
<td>37,000 gal</td>
<td>air</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Atqasuk</td>
<td>NSB</td>
<td>580,000 gal</td>
<td>N/A</td>
<td>70,000 gal</td>
<td>air/rollagon</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Utqiagvik</td>
<td>SKW/Crowley/NSB</td>
<td>750,000 gal - NSB</td>
<td>270,000 gal-NSB</td>
<td>Barge</td>
<td>Adequate to meet projected demand of 11 mmcfd</td>
<td>Pipeline / Dispenser</td>
<td>Electricity and home heating are mostly NG</td>
<td></td>
</tr>
<tr>
<td>Kaktovik</td>
<td>NSB</td>
<td>1,035,000 gal</td>
<td>N/A</td>
<td>60,000 gal</td>
<td>Barge</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>NSB</td>
<td>410,000 gal</td>
<td>N/A</td>
<td>60,000 gal</td>
<td>air</td>
<td>Up to 500 mmcfd provided by Alpine, line capacity is 2.6mmcfd</td>
<td>Pipeline</td>
<td>Electricity and home heating are mostly NG</td>
</tr>
<tr>
<td>Point Hope</td>
<td>NSB</td>
<td>1.1 mil gal</td>
<td>N/A</td>
<td>150,000 gal</td>
<td>barge</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Point Lay</td>
<td>NSB</td>
<td>838,000 gal</td>
<td>N/A</td>
<td>30,000 gal</td>
<td>barge</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Wainwright</td>
<td>NSB</td>
<td>855,000 gal</td>
<td>N/A</td>
<td>178,000 gal</td>
<td>barge</td>
<td>N/A</td>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

\(^{399}\) Volumes taken from NSB Spill Prevention, Control, and Countermeasure (SPCC) Master Plan, except for Utqiabvik. Volumes are believed to be nominal.
Table 47: Energy Efficiencies

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>Current CIPM project: AW power distribution upgrades(includes metering upgrades)</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>Current CIPM project: AW LED Street Lighting upgrades</td>
<td>Upgrades to pp switchgear and controls. Design is in progress</td>
<td>add heat recovery to water system</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>Current CIPM project: AW power distribution upgrades(includes metering upgrades)</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>Current CIPM project: AW LED Street Lighting upgrades</td>
<td>Heat recovery used in water system / vac system</td>
<td></td>
</tr>
<tr>
<td>Utqiagvik</td>
<td>ongoing</td>
<td>high</td>
<td>ongoing</td>
<td></td>
<td></td>
<td>No heat recovery</td>
<td></td>
</tr>
<tr>
<td>Kaktovik</td>
<td>Current CIPM project: AW power distribution upgrades(includes metering upgrades)</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>Current CIPM project: AW LED Street Lighting upgrades</td>
<td>heat recovery used at water plant -</td>
<td>upgrade project in design for public buildings</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>Current CIPM project: AW power distribution upgrades(includes metering upgrades)</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>Current CIPM project: AW LED Street Lighting upgrades</td>
<td>heat recovery used in public buildings</td>
<td>upgrade project to the washeteria / need heat recovery at water plant</td>
</tr>
<tr>
<td>Point Hope</td>
<td>Current CIPM project: AW power distribution upgrades(includes metering upgrades)</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>Current CIPM project: AW LED Street Lighting upgrades</td>
<td>heat recovery used in public buildings</td>
<td></td>
</tr>
<tr>
<td>Point Lay</td>
<td>Current CIPM project: AW power distribution upgrades(includes metering upgrades)</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>Current CIPM project: AW LED Street Lighting upgrades</td>
<td>heat recovery used in water system</td>
<td>add heat recovery to wastewater treatment system</td>
</tr>
<tr>
<td>Wainwright</td>
<td>Current CIPM project: AW power distribution upgrades(includes metering upgrades)</td>
<td>high</td>
<td>high</td>
<td>high</td>
<td>Current CIPM project: AW LED Street Lighting upgrades</td>
<td>heat recovery used in water system &amp; public works building</td>
<td></td>
</tr>
</tbody>
</table>
Appendix E: Adaptation Strategies for Climate Change Impacts

Table 48: Adaptation Strategies for Climate Change Impacts

<table>
<thead>
<tr>
<th>Weather-related physical change</th>
<th>Potential impacts to the village</th>
<th>Adaptive Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Warmer weather causes thinner lake, river and sea ice. Thawing permafrost. Permafrost soils throughout the Arctic contain almost twice as much carbon as the atmosphere. Warming and thawing of these soils increases the release of carbon dioxide and methane through increased decomposition. Thawing permafrost delivers organic-rich soils to lake bottoms where decomposition in the absence of oxygen releases additional methane in these water bodies.</td>
<td>Flooding or damage to ice cellars result in food contamination and food insecurity. This forces families to eat non-traditional and less healthy/nutritious packaged “store bought” food flown in at great expense. Hunters would have to spend greater financial resources and more time, encompassing greater hazards, to find riverine and terrestrial species—beyond the 10 to 15 miles ideal distance—and into unsafe sea ice conditions. Unknown ice thickness creates hazards for hunters and other winter travelers on snow machines. Traditional knowledge cannot be relied upon as the thinner ice conditions change seasonally and can be exacerbated yearly. Warmer water in lakes and streams cause fish to die in nets, fish texture “softer” and drying of fish is more difficult.</td>
<td>Each village establishes a communication system with residents traveling to hunt, fish and gather foods and travelers on the ice are required to carry emergency GPS tracking devices. Village Search &amp; Rescue teams are properly equipped to rescue travelers in trouble. Permit stipulations for Oil &amp;Gas or commercial tourism travel could require a subsistence mitigation fund which would provide funds to hunters to cover the costs to purchase adequate boats, fuel and equipment to find and harvest subsistence resources at the greater distance from their traditional migratory routes. Aerial “flyovers” of traditional routes with specialized equipment to measure the depth of ice and then posting and advertising to the village the safest route to take on the ice for hunting expeditions and for traveling to common destinations such as the nearby village.</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>Weather-related physical change</th>
<th>Potential impacts to the village</th>
<th>Adaptive Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>(continued) Warmer weather causes thinner lake, river and sea ice. Thawing permafrost. Permafrost soils throughout the Arctic contain almost twice as much carbon as the atmosphere. Warming and thawing of these soils increases the release of carbon dioxide and methane through increased decomposition. Thawing permafrost delivers organic-rich soils to lake bottoms where decomposition in the absence of oxygen releases additional methane in these water bodies.</td>
<td>Fresh water drains downward—loss of drinking water supply. Village water lines break, causing loss of service. Methane gas escapes from the permafrost and rises into the atmosphere, the drinking water in lakes, and in rivers which affects the riverine/marine life.</td>
<td>A village-specific adaptation plan would identify specific hazards associated with the thawing of permafrost in and near the village and would identify options for remedying impacts or avoiding these hazards. It would identify options and the costs and benefits of each option. It is noted that all fresh water lakes in the region are underlain by permafrost and, therefore all freshwater drinking supplies are vulnerable/susceptible to the draining of water and the release of methane. A potential option may be to build a water reservoir with an impenetrable cover and then pump fresh water from nearby sources into this man-made lake. This would protect the drinking water source from the thawing permafrost and from the escaping methane.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Weather-related physical change</th>
<th>Potential impacts to the village</th>
<th>Adaptive Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>(continued)</td>
<td>Methane rising to tundra—changes “taste” of lichen, moss, etc. for caribou and other land animals</td>
<td>NSB Wildlife biologists and subsistence hunters should observe the behaviors of tundra-dependent animals to determine if this is a significant problem. If it is, it may be necessary for the NSB to experiment and “grow” lichen and moss seeds and spread them around a traditional caribou migratory route or create a new migratory route with the plant life that they find suitable.</td>
</tr>
<tr>
<td>Warmer weather causes thinner lake, river and sea ice.</td>
<td>Less stable ground, subsidence and differential settlement of structures. Sanitation and health problems result from broken sewer and water lines within the villages.</td>
<td>Among other measures, the NSB could assist the villages in procuring gravel to shore up buildings, roads and other infrastructure. It may be fruitful to partner with research universities to create a new material that can be produced locally in each village that functions like or better than gravel.</td>
</tr>
<tr>
<td>Thawing permafrost. Permafrost soils throughout the Arctic contain almost twice as much carbon as the atmosphere. Warming and thawing of these soils increases the release of carbon dioxide and methane through increased decomposition.</td>
<td>Flooding and structural failure of ice cellars. This can result in food contamination and, if ice cellars need to be abandoned, can lead to food insecurity as there is no room in village homes for storage of a freezer. This would lead families to be dependent on “store bought” food which lacks the nutrients of traditional, local foods.</td>
<td>Although culturally difficult to adjust to, it may be necessary for the village leaders to build a community or co-op ice cellar in a convenient location. The location should be convenient to hunters as well as to family members retrieving the foodstuff.</td>
</tr>
<tr>
<td>Thawing permafrost delivers organic-rich soils to lake bottoms where decomposition in the absence of oxygen releases additional methane in these water bodies. 402</td>
<td></td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Weather-related physical change</th>
<th>Potential impacts to the village</th>
<th>Adaptive Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early snow melt.</td>
<td>Early snow melt on land exposes the mushy/marshy tundra and reduces the hunting season and tundra travel is too difficult. Early snow melt may alter subsistence species’ migratory schedule and routes, causing hunters to travel greater distances to find the resource.</td>
<td>Early snowmelt results in reduced days for oil &amp; gas industry to traverse frozen ground for exploration, development or transporting the resource to market. Limited season for ice roads.</td>
</tr>
<tr>
<td>Increased inland rain.</td>
<td>Increased rain on snow events during winter cause a layer of ice to form over tundra vegetation preventing grazing by animals like caribou and muskoxen; this causes die-offs of these animals</td>
<td></td>
</tr>
<tr>
<td>Warmer temperatures on the tundra. Caribou herds will face a variety of climate-related impacts resulting in changes in their migration routes, calving grounds, forage availability and drinking water sources as snow and river ice conditions change, permafrost thawing results in tundra subsidence and methane gas release into fresh water lakes, and warmer weather dries the tundra making it susceptible to wildfires.</td>
<td>Warmer weather inland causes drying of tundra which makes the land susceptible to lightning-caused fires which can spread for many miles. Warmer weather also causes lakes to dry up from evaporation, along with the thawing permafrost and resulting draining.</td>
<td>Increase fire-fighting capabilities for both wild fires and structures. Protect drinking water lakes or develop new reservoirs with lining that protects against leaks and methane releases from underlying permafrost.</td>
</tr>
<tr>
<td>Weather-related physical change</td>
<td>Potential impacts to the village</td>
<td>Adaptive Response Options</td>
</tr>
<tr>
<td>------------------------------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>(continued)</td>
<td>Drier tundra soil cause berries to ripen early and spoil faster.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Warmer weather increase insect harassment for berry harvesters.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intrusion of non-native species that may cause environmental harm; Some species such as salmon</td>
<td></td>
</tr>
<tr>
<td></td>
<td>species and cold-tolerant crab may increase in abundance in arctic waters. This could attract</td>
<td></td>
</tr>
<tr>
<td></td>
<td>commercial fishing industries to the arctic seas which could diminish subsistence resources.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tundra ecosystems could change to spruce/aspen forests and grasses could be incorporated into</td>
<td></td>
</tr>
<tr>
<td></td>
<td>the tundra. Shrubs entering the tundra could attract moose while decreasing the lichen for</td>
<td></td>
</tr>
<tr>
<td></td>
<td>caribou.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>New plant species could attract new species of pests which could annoy caribou.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Declining or shifting wetlands could affect migratory or resident bird species.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Industrial development relying on ice roads for access to development sites could be stymied</td>
<td></td>
</tr>
<tr>
<td></td>
<td>by a reduced supply of water to create the roads.</td>
<td></td>
</tr>
<tr>
<td>Weather-related physical change</td>
<td>Potential impacts to the village</td>
<td>Adaptive Response Options</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>---------------------------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>(continued)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warmer temperatures on the tundra. Caribou herds will face a variety of climate-related impacts resulting in changes in their migration routes, calving grounds, forage availability and drinking water sources as snow and river ice conditions change, permafrost thawing results in tundra subsidence and methane gas release into fresh water lakes, and warmer weather dries the tundra making it susceptible to wildfires.</td>
<td>A drier tundra: Although rain will increase, evapotranspiration and water drainage from cracks in the permafrost will cause a drier tundra that will be susceptible to more numerous and intense tundra fires releasing carbon and contaminants like mercury into the atmosphere.</td>
<td>Villages do not have the trained staff or equipment to extinguish wildfires which threaten homes, traditional foods, food sources for wildlife and creates smoke which causes or exacerbates respiratory illness in humans and animals. Wildlife change their migratory routes in subsequent years due to the damage to their foodstuff and nesting/calving lands.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Slow recovery of vegetation or vegetative shifts after fires can profoundly affect wildlife. Lichens, a critical winter food for caribou, recover extremely slowly. Loss of food for caribou cause the herd to change routes which may be a greater distance from the village causing economic hardships (gas, equipment repair, time) and hazards (thinning ice) for subsistence hunters.</td>
</tr>
<tr>
<td>Weather-related physical change</td>
<td>Potential impacts to the village</td>
<td>Adaptive Response Options</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>---------------------------------</td>
<td>---------------------------</td>
</tr>
<tr>
<td>Acid Rain. Toxins such as DDT, PCBs, dioxin, pesticides and heavy metals are carried by both air and ocean currents thousands of miles to the colder arctic ecosystem. The cold Arctic environment is a “sink” or settling area for these contaminants which circulate around the globe northward in air and ocean currents. They settle out in Arctic waters, sea ice, and land, where they remain for long periods and break down very slowly because of the colder climate. The effects of these toxins are magnified as they are ingested by animals rising up the food chain. This is causing a health crisis among the Inuit people in the Arctic Circle. As a result, both land and sea dwelling animals ingest the toxins. On land the toxins are deposited into the plant life and eaten by Caribou, once source of food for the Inuit. In the water, the toxins are found in plankton, which fish in turn eat. These fish then become a source of food for seals and polar bears.</td>
<td>The North Slope is fortunate that major contaminant transport pathways tend to lead elsewhere, such as Canada and Greenland. The Slope receives some contaminants from Asia but levels are still relatively low. Consumers of subsistence-harvested foods from the North Slope are fortunate that the scientific analysis that the NSB Wildlife Management Department conducts have shown very low levels of POPs to be present in many of the subsistence foods that we eat and are below levels of public health concern. Their studies demonstrate that subsistence foods are healthy foods.</td>
<td>The NSB Wildlife Management Department continues to monitor and analyze subsistence animals for human dietary health benefits as well as for potential impacts of consuming toxins. Hunting and harvesting marine and riverine animals and air and terrestrial animals is an important part of the Iñupiaq lifestyle. It is not only an important part of their culture, passed down through the generations, but it also provides food. Traditional subsistence foods provide relatively inexpensive and readily available nutrients, essential fatty acids, antioxidants, calories, protein, and many health benefits. Some of these benefits include protection from diabetes and cardiovascular disease, improved maternal nutrition and neonatal and infant brain development. Severely limiting the consumption of traditional foods may result in harm because reduction of the consumption of foods that have health benefits may increase the consumption of less healthy “store bought” foods.</td>
</tr>
</tbody>
</table>

Weather-related physical change | Potential impacts to the village | Adaptive Response Options
---|---|---
(continued)
These toxins are called Persistent Organic Pollutants (POPs) because they are persistent: they travel long distances; they persist long after they are released at their source and move from air and water into spoil, plants, animals and humans; they magnify in living organisms and accumulate in fat, organs and muscles; they can reduce the animal’s ability to conceive and carry offspring; they decrease the animal’s ability to fight off disease; they can impair brain function; and a number of POPs are carcinogenic, causing cancers.

Migratory birds can have 100 times higher concentrations of POPs compared to birds that do not migrate.

In the Arctic, human exposure to toxins occur primarily through eating of subsistence foods. 404, 405, 406

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### Weather-related physical change

<table>
<thead>
<tr>
<th>Weather-related physical change</th>
<th>Potential impacts to the village</th>
<th>Adaptive Response Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Higher levels of ultraviolet (UV) radiation. Due to greenhouse gas effects of the stratospheric ozone temperatures, UB radiation in the Arctic is projected to remain elevated.(^{407})</td>
<td>Increased UV exposure can cause skin cancer, cataracts, and immune system disorders in humans. Elevated UV can disrupt photosynthesis in plants and can have detrimental effects on the early life states of fish and amphibians. Risks are greatest in the Spring when sensitive species are most vulnerable, and warming-related declines in snow and ice cover increase exposure for organisms normally protected by such cover.</td>
<td>Vigilance and adaptation to changing conditions are required. Alaskan Native communities have for centuries adapted to scarcity and environmental variability and, thus, have developed deep cultural reservoirs of flexibility and adaptability; this tradition must continue.</td>
</tr>
<tr>
<td>Multiple Impact Stresses.</td>
<td>Weather-influenced changes to the ecosystem cause overlapping stresses which amplify or exacerbate any one impact.</td>
<td></td>
</tr>
</tbody>
</table>

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### Appendix F: Public Review Comments

<table>
<thead>
<tr>
<th>No.</th>
<th>Commenter</th>
<th>Comment</th>
<th>Draft Page</th>
<th>Final Page</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Planning Team</td>
<td>Executive Summary is needed</td>
<td>NA</td>
<td>ES-1</td>
<td>Executive summary is included.</td>
</tr>
<tr>
<td>2</td>
<td>NSB Planning Department</td>
<td>Clarification on the history of PET #4</td>
<td>9</td>
<td>9</td>
<td>After a bleak period in the 1930s, the economic picture improved during World War II for the country and for the Arctic region. Native craft sales increased due to the influx of military personnel. Mineral exploration programs <em>within the and the Naval Petroleum Reserve #4 (PET 4), established by President Warren G. Harding in 1923 began</em> (now NPR-A) <em>opened</em> and in 1946, Iñupiat were hired as laborers with a flexible schedule that allowed for subsistence hunting.</td>
</tr>
<tr>
<td>3</td>
<td>Comp Planning Team</td>
<td>Iñupiaq translation for the vision statement is needed</td>
<td>67</td>
<td>67</td>
<td>Translation is now included.</td>
</tr>
<tr>
<td>4</td>
<td>NSB Planning</td>
<td>Reference that the list of impaired water bodies posted on the ADEC website is from EPA and was last updated in 2010 - 9 years ago. This list does not show impaired bodies that may have been discovered since 2010.</td>
<td>90</td>
<td>90</td>
<td>Water Quality. <em>A list of impaired waters is maintained by the ADEC, however no impaired waters are listed within the NSB. The ADEC Alaska Monitoring and Assessment Program conducts aquatic resource surveys across Alaska to measure water quality based on a variety of indicators, including chemical contaminants, macroinvertebrate community structure, and water chemistry. A list of impaired waters is maintained by the ADEC. There are not any impaired water bodies within the NSB included in the ADEC Catalog. However, the Catalog has not been updated since 2010, however no impaired waters are listed within the NSB.</em></td>
</tr>
<tr>
<td>5</td>
<td>NSB Planning</td>
<td>Wood Bison were hunted to extinction 200 years ago and have only recently been re-introduced to Alaska. The current location of the re-introduced herd core range is the Lower Yukon/Innoko Rivers. While the eastern part of North Slope may have been part of the Wood Bison's historic range (based zoo archeological, paleontological, oral and written historical documentation), it is not a species that currently lives on the North Slope - nor will it based on ADF&amp;G’s management plan.</td>
<td>93</td>
<td>93</td>
<td>Wood bison has been removed from Table 12: NSB Endangered Species.</td>
</tr>
</tbody>
</table>
6. Bill Tracey

Subsistence. Subsistence has an unknown future – facing more hunters than ever before – climate change issues – industry and development in every direction, land and sea and air, ice conditions all adds up to uncertainty and then plug in regulations and what that can do to your average. NS family diet-wise village stores will have to where game food becomes short or unavailable.

7. NSB Administration

Update 2017-2018 Service Interruptions table

<table>
<thead>
<tr>
<th>Community</th>
<th>Annual Service Interruption Rate*</th>
<th>Interruption days more than 5**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anaktuvuk Pass</td>
<td>9.1 10%</td>
<td>25.0 36%</td>
</tr>
<tr>
<td>Atqasuk</td>
<td>2.3 5%</td>
<td>0.0 25%</td>
</tr>
<tr>
<td>Kaktovik</td>
<td>8.0 18%</td>
<td>10.0 14%</td>
</tr>
<tr>
<td>Nuiqsut</td>
<td>7.0 17%</td>
<td>5.0 32%</td>
</tr>
<tr>
<td>Point Hope</td>
<td>11.0 35% / 10%¹</td>
<td>15.0 22%</td>
</tr>
<tr>
<td>Point Lay</td>
<td>30.4 26%</td>
<td>60.0 67%</td>
</tr>
<tr>
<td>Utqiagvik</td>
<td>3%</td>
<td>3%</td>
</tr>
<tr>
<td>Wainwright</td>
<td>10.5 51% / 27%²</td>
<td>20.0 25%</td>
</tr>
</tbody>
</table>

*An annual service interruption rate of 20% means that 2 out of 10 homes experienced service interruptions. It also means that 80% of the community did not experience any service interruptions.

**An interruption day’s rating of 30% means that out of all the service interruptions, 30% experienced a service interruption of 5 days or more.

¹ These communities experienced major events which affected a large number of services for a short time. The major events skew the data, so the Service Interruption Rate is shown with and without those events. More detail on the events is provided in the following paragraphs.

² Many homes in Point Lay are going to tanked service. With those homes removed, the service interruption rate has dropped from previous years.

Point Hope’s major event during 2017 – 2018 was a vacuum system failure in March 2018. Services were restored in one day. Since upgraded vacuum pumps have been installed, the vacuum system has been very reliable and the service interruption rate has dropped.
<table>
<thead>
<tr>
<th>No.</th>
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</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>NSB Administration</td>
<td>[continued] Update 2017-2018 Service Interruptions table</td>
<td>135</td>
<td>[continued]</td>
<td></td>
</tr>
</tbody>
</table>
Wainwright’s major event was a clogged sewer main caused by a large section of in-line heat trace which had come loose and blocked the main. Service was restored temporarily several times and the blockage was cleared within a week. Planned repairs and maintenance activities which affect many services are not included in these rates. An example is a scheduled water main isolation to repair a leak. Residents are notified ahead of the short-term interruption. If such service interruptions were included in the rates, they would show that the infrastructure is in worse condition than it actually is.
Examining the rates on a quarterly basis shows that most interruptions happen during cold weather. Preventative maintenance efforts are underway to make service better-insulated, heated, and air-tight. These efforts will reduce the overall number of service interruptions in the future. |
<p>| 8   | Flora Ipalook | Individual homeowners during each hunting season, during each catch — people are using their driveways to cut, prepare, and store our foods. Another option would be to add gravel to the back of homes to provide space to “work” on the catch. This would eliminate using the front (driveway) of the home and eliminate dust from getting on the meats. Would also give space to build a meat rack and hang meat to dry. Nuiqsut’s residential homes have the space in back of the homes to use this option. During winter months, this would also eliminate unnecessary ATVs/snowmachine traffic. | NA | 147 | Village comprehensive plans include a discussion on gravel needs specific to each community. This NSB Comprehensive Plan also includes the following statement: Village residents have often expressed the need to purchase gravel for private use - to shore up driveways, pilings, or other construction needs. Unfortunately, due to the limitations of capital funding through general obligation bonds, the borough is unable to make its gravel available for private use. |
| 9   | Bill Tracey | SA-10. I know a lot of village residents that think that Prudhoe Bay and SA-10 is all oil companies. Need to spell out the difference, what is the borough and taxation. | 159 | 159 | Service Area 10 is managed by the North Slope Borough and encompasses the area lying generally between the National Petroleum Reserve-Alaska and the Arctic National Wildlife Refuge and extends from the Beaufort Sea south to 70° latitude. After creating Service Area 10, the Borough Assembly made provision for a solid waste collection and disposal district and a sanitary waste collection and disposal district in the area. SA-10 encompasses approximately 3,000 square miles. There is not a residential community in Deadhorse or the Prudhoe Bay region. Workers in the region reside there on a part-time, nonpermanent basis and travel to the region specifically for work in oil and gas industry. Few North Slope residents are employment in the Prudhoe Bay area. |</p>
<table>
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</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>Leslie S. Segevan</td>
<td>All North Slope villages need to construct evacuation roads to the mountains before the war in the middle reach North Slope. And before the roaring seas come in all the way to the mountains. This should be considered a top priority for all North Slope villages. Everyone’s lives that live on the North Slope hangs in the balance in this decision.</td>
<td>NA</td>
<td>181</td>
<td>Village comprehensive plans include a discussion on evacuation roads. This statement has been added to this NSB Comprehensive Plan: <em>Many communities have expressed the desire for evacuation roads for emergency egress.</em></td>
</tr>
<tr>
<td>11</td>
<td>NSB Planning</td>
<td>The line for Point Thomson in Table 25 lists Exxon as the owner and Mobil as status. It should be changed the owner to ExxonMobil and status to Private oilfield airstrip.</td>
<td>190</td>
<td>190</td>
<td>The Point Thomson landing strip is now listed as owned by Exxon Mobil and the status as private oilfield airstrip.</td>
</tr>
<tr>
<td>12</td>
<td>NSB Planning</td>
<td>The USCG is undertaking another Port Access Route Study for the Arctic Ocean Coast along the Coast of Alaska. The study is anticipated to be completed within 48 months. Federal Register notice was given on December 21, 2018, vol 83, No. 245, page 65701.</td>
<td>199</td>
<td>199</td>
<td><em>The USCG is undertaking another Port Access Route Study for the Arctic Ocean coast in Alaska. The study is anticipated to be completed within the next two years.</em></td>
</tr>
<tr>
<td>13</td>
<td>Bill Tracey</td>
<td>I’m excited to know that ASTAR is working closely with this plan and the NS that what it will take to move forward and for the NS to be in the driver seat to promote our communities needs to get the best benefit of any transportation project with a direct reflection for our communities.</td>
<td>200</td>
<td>200</td>
<td>...The project will identify potential infrastructure projects beneficial to the region. This multi-year effort that is still in its infancy. <em>The borough is a leader and key partner in the ASTAR effort.</em></td>
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<td>14</td>
<td>TNHA</td>
<td>Jim Fowler of Energy Audits of Alaska has a graphic showing this precise breakdown for Atqasuk [of electric energy requirements], a representative village within the NSB, based on an analysis done for the proposed intertie there.</td>
<td>213</td>
<td>NA</td>
<td>No change has been made. This regional plan is not meant to provide detailed energy use on specific villages.</td>
</tr>
<tr>
<td>15</td>
<td>TNHA</td>
<td>Misleading. This is true in limited cases, like LED lighting retrofits or controls programming, but the greatest energy-efficiency gains take considerable, coordinated inputs to achieve, and have substantial non-energy benefits, such as better thermal comfort, indoor environmental quality, enhanced durability, occupant productivity, etc. that should be included in every capital investment analysis. This is particularly true for deep retrofits on homes and buildings.</td>
<td>213</td>
<td>213</td>
<td>In the extreme climate of arctic Alaska, <em>some energy efficiency improvements, such as LED lighting retrofits and controls programming</em> can provide substantial benefit for a minimal amount of input. <em>The greatest energy efficiency gains take more considerable and coordinated effort to achieve.</em></td>
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<td>16</td>
<td>TNHA</td>
<td>Clarify: Are these figures based on modeled or measured savings? Research has shown that energy models that are not calibrated to actual baseline energy consumption patterns tend to over-estimate savings, a significant barrier to investor confidence in energy-efficiency projects. Given that most of Interior Alaska heats with fuel from tanks, which makes tracking actual usage difficult, these numbers should be disclaimed as estimates unless factual evidence of these results can be obtained.</td>
<td>214</td>
<td>214</td>
<td>[Added references to the statement for clarification] These programs have been particularly successful in the interior northern Alaska region, with an average of 43 percent reduction in energy use and a 29 percent reduction in home energy costs in those homes that have been retrofitted through weatherization programs. *Cold Climate Housing Research Center. 2012. Weatherization Assistance Program Outcomes. <a href="http://www.cchrc.org/sites/default/files/docs/WX_final.pdf">www.cchrc.org/sites/default/files/docs/WX_final.pdf</a>. *Household energy savings are computer by using AKWarm, an AHFC-developed building energy modeling software which models expected energy consumption based on a home’s construction, features, appliances, and results from tests conducted on the home by certified energy raters. Since 1997, at least six studies have been undertaken to evaluate the accuracy of AKWarm’s residential energy assessment model and each have concluded that AKWarm produces a statistically accurate estimate of annual home energy.</td>
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<td>17</td>
<td>TNHA</td>
<td>The weatherization program operated by the NSB public works department ceased operation June 30, 2018. It made use of some AHFC funds, but was mostly supported from the NSB general fund. About 200 homes have benefited from AHFC-funded low-income weatherization or RELI (a similar NSB initiative) since 2008. While several dozen public and commercial buildings received investment-grade energy audits in 2011-2012 through an AHFC grant program, the majority of the findings were not implemented and the audits are now out of date.</td>
<td>214</td>
<td>214</td>
<td>The North Slope Borough’s Public Works Department typically manages managed program funds in the North Slope region. The weatherization program ceased operation on June 30, 2018. Many homes and commercial buildings, through NSB, have benefited from these programs, however much of the available funding goes unrequested and unused.</td>
</tr>
<tr>
<td>18</td>
<td>TNHA</td>
<td>Context: The lower relative “normal” electrical demand of other homes in the community is likely a reflection of their inadequate ventilation systems. Most Arctic homes are under-ventilated, and occupants suffer poor indoor environmental quality (IEQ) and health problems as a result. The significant share of medical admissions related to respiratory illness in the region is well-documented, and unhealthy housing is recognized as a big driver. The increased electrical energy requirements of ventilation are justified by health outcomes for a</td>
<td>215</td>
<td>215</td>
<td>Monitoring of the prototype home in Anaktuvuk Pass has shown a marked decrease in heating fuel usage to approximately 27 percent of normal community average. However, the average electrical demand was approximately 168 percent of the normal community average, and contribution from solar has not been dramatic.</td>
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<tr>
<td>18</td>
<td>TNHA</td>
<td>[continued] population that spends over 90% of its time indoors. Context: This is a six-panel test array (~1 kW) installed at a time when solar PV prices were over 70% higher than they are now. Its contribution was not meant to be dramatic. For comparison, the average American rooftop photovoltaic (PV) array installed in 2018 is closer to 6 kW.</td>
<td>215</td>
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<td>19</td>
<td>TNHA</td>
<td>Clarify: There is a difference between the consumer feedback devices and apps described here—which utilize meter data—and the actual “smart” meter hardware installed and monitored by the utility. Clarify: This is different than the in-home “smart” meters described above. Context: This is a commendable initiative, but it only captures electrical usage data, only 30-40% of the village’s total energy load, as put forth earlier in this chapter. Heating fuel is the majority of energy demand in a village. An inexpensive interim solution would be for the NSB to standardize a format for reporting fuel delivery data in each village and then enforce the practice. Since the NSB provides the fuel at low or no cost to the village corporations, who charge fees to distribute it to end users, this should be a basic stipulation of the fuel agreements with these corps. This practice would give the NSB a start on benchmarking its building-level energy use with sufficient data resolution to target the highest users for efficiency retrofits. The NSB could leverage avoided cash flows based on real-world baseline data to seek grants and loans to retrofit their own buildings, and provide rebates to contractors to retrofit residences more affordably for homeowners. At the end of the day, investment in energy monitoring and efficiency is a moral choice: every dollar wasted because energy isn’t well managed is a dollar that can’t be invested in public safety, education, health, housing, etc.</td>
<td>215</td>
<td>215</td>
<td>One way to advance energy efficiency is through better tracking of energy use, for example, smart meters can be utilized that teach energy efficiency and awareness through providing feedback on electrical energy usage to the consumer and/or utility provider. Studies have shown that an average of 20 percent can be saved on electric bills with these devises. A smart energy meter placed within households allows each individual to monitor energy usage and predict monthly electric cost. The smart meter can show energy use in real time and also warns when the power cost equalization (PCE) or NSB subsidy limit has been reached (600 kilowatt hour (kWh)), the point at which the cost dramatically increases. The average smart meter user can saves 5 – 30 percent off their electricity bill when using these meters. Smart meters also come with two-way communication capability – allowing the utility to retrieve data remotely, as well as disconnect or limit customers’ electrical consumption for non-payment. A NSB CIPM program is in place to install a smart meter system area wide. Existing smart meter systems are problematic in certain communities, and all are being evaluated so that, ultimately, a common system will be identified that will work for all communities.</td>
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<td>20</td>
<td>TNHA</td>
<td>This is debatable. While it is true that some capital upgrades have resulted in increased efficiencies, e.g. street lighting, the NSB does not appear to have made energy efficiency a priority.</td>
<td>215</td>
<td>215</td>
<td>All of the NSB communities have potential for energy efficiency upgrades. For the most part, these potentials have been recognized by NSB and, as funding becomes available, upgrade projects are initiated. No change. The NSB prioritizes energy efficiency. A review of the capital program reveals that when and where possible, NSB seeks to increase efficiencies. For instance, power plant generators are maintained, replaced, and combined to maximize energy efficiencies and save fuel.</td>
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<tr>
<td>21</td>
<td>TNHA</td>
<td>This seems to contradict the statement on pg. 214 that “Many homes ... throughout NSB, have benefited from these programs...”</td>
<td>215</td>
<td>215</td>
<td>In general, these upgrade projects tend to be related to NSB infrastructure, and not as targeted toward community housing, although there has been some energy audit and weatherization work. Since these programs began, very few housing units in the region have participated in the AHFC Home Energy Rebate or Weatherization program.</td>
</tr>
<tr>
<td>22</td>
<td>TNHA</td>
<td>Verify: was the Housing Solution Group rolled into the new Housing Department? Expand: This is a good recommendation, but since audits are labor intensive, homes should first be targeted based on consumption; see comment on pg. 216. Weatherization could be provided directly at no cost to low-income homes while rebates for energy-efficiency upgrades could be provided to contractors to leverage the private market for home renovations in a manner that reduces energy cost to the NSB. The NSB has the most to gain from weatherization. However, direct funding should be predicated on performance; if AkWarm models are used to estimate the amount of this funding, they should be calibrated to the actual utility history. See ANSI/BPI Standard 2400-5-2015.</td>
<td>216</td>
<td>216</td>
<td>There are several organizations, both within and external to the NSB, that are purposed for providing funding, help in obtaining funding, and coordinating projects relating to energy-efficiency upgrades. Specifically, the NSB has its own Housing Solutions Group and Housing Department that is dedicated to areawide housing. Additionally, the Housing Solutions Group that is focused primarily on housing costs and design and the is being rolled into the newly re-established Housing Department was just re-established this year. The NSB should take increased initiative for providing home energy audits and weatherization by one or both of the housing groups within the NSB could pursue pursuing funding and assistance sources for these programs. NSB should also analyze which types of homes should be targeted for upgrades as well as the cost effectiveness of providing direct funding to individual homeowners for weatherization, should outside funding not be available or too cumbersome to acquire.</td>
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<tr>
<td>23</td>
<td>TNHA</td>
<td>Rephrase. If anything, thanks to stronger energy codes, material innovations, green appraisals and sales premiums, mainstream builders have taken lessons from energy-efficiency pioneers.</td>
<td>216</td>
<td>216</td>
<td>Annual energy costs are becoming more and more of the total cost of ownership, and mainstream energy-efficient designs are becoming more in line with other forms of construction. Homebuilders are increasingly incorporating energy-efficient designs as standard features.</td>
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<td>24</td>
<td>TNHA</td>
<td>Clarify: Wind- and solar-generated electricity in excess of load may be converted to heat, but that is conceptually distinct from a CHP (cogeneration) system wherein BTUs are recovered as a byproduct of simultaneous power generation. Wind and solar do not generate heat and power simultaneously. Only that portion of a wind or solar plant’s output that exceeds load can be converted to heat.</td>
<td>224</td>
<td>224</td>
<td>Italic is additions; strikethrough are deletions</td>
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<tr>
<td>25</td>
<td>TNHA</td>
<td>Misleading: Research is not the barrier (that said, there is research available for review). Photovoltaic solar is a mature technology and has been one of the fastest growing sectors of the U.S. economy for several years. The Bureau of Labor Statistics predicted that solar installers will be the fastest-growing occupation from 2016-2026. UAF publishes a solar design manual for Alaska; a 5th edition was recently released. Commercial solar plants are going up in Alaska: GVEA commissioned a 563 kW utility-scale solar farm in Fairbanks in October 2018 at an installed cost under $2 per watt, and a 100 kW array was commissioned in Willow the month before that.Misleading: solar is not a cogeneration system.</td>
<td>224</td>
<td>224</td>
<td>Italic is additions; strikethrough are deletions</td>
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<td>26</td>
<td>TNHA</td>
<td>Expand: Solar costs have dropped by more than 70% since 2010. Known or not, the costs to install a system in 2009 are obsolete and have little bearing on a planning document with a 2019-2039 outlook. Rephrase: The word “only” here suggests bias that solar PV is not economically viable. The capital cost of the present system is likely under $7,000 today.</td>
<td>224</td>
<td>224</td>
<td>Italic is additions; strikethrough are deletions</td>
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The cost of electricity to the NSB in Anaktuvuk Pass is approximately $1.05/kWh. The resulting cost savings from solar would be approximately about $80 per month. The cost to install a prototype home solar system is not known current; the data available is for the home built in Anaktuvuk Pass in 2009. Without more solar system data and installation costs available for the North Slope region, the true cost is difficult to determine due of high transportation costs. The $80 per month would only offset a capital investment of approximately $14,000 over a 25 year life.
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<td>27</td>
<td>TNHA</td>
<td>Expand and clarify: Cost reductions should not be attributed to technological breakthroughs alone. The drop in the price of wind and solar power over the past decade, for example, was driven largely by government policies, such as the DOE SunShot Initiative, ARPA-E, ITC and PTC, and massive disruption in the global supply chain (e.g., early growth in the Chinese solar industry). The NSB should embrace strong policies that facilitate the integration of affordable energy alternatives.</td>
<td>227</td>
<td>227</td>
<td>New energy technologies are constantly being developed constantly. Any of these developments could lead to sufficient enough changes in the costs associated with alternative energy production to make that production feasible. Other factors can affect the cost, such as government policies and requirements.</td>
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<td>28</td>
<td>TNHA</td>
<td>Absolutely. Creation of an “Energy and Sustainability” unit within the administration of the public works department was floated in late 2017. This proposed unit was to focus on completing the NSB Regional Energy Plan, facility benchmarking, landfill waste diversion, alternative energy and public energy literacy. Current status unknown. The NSB should follow the example of the NW Arctic Borough, the Muni of Anchorage, and the Fairbanks North Star Borough, all of which have appointed dedicated energy managers. This is usually an individual professionally trained in an engineering discipline who holds the AEE Certified Energy Manager credential.</td>
<td>227</td>
<td>227</td>
<td>NSB should expand the responsibilities of an existing department to foster and develop alternative energy solutions, or create a department solely dedicated to this purpose. The potential economic and environmental gains to be found in alternative energies, or lost potential for not following up alternative energies, are enormous when considering the annual costs associated with providing energy to the villages. Comment acknowledged. No change.</td>
</tr>
<tr>
<td>29</td>
<td>TNHA</td>
<td>Expand: True CHP (e.g. a gas-fired plant in Utqiaġvik or Nuiqsut) has the benefit of increasing power reliability in the event of grid failure, as it enables each building equipped with it to operate as a de facto microgrid. The aging switchgear at BUECI, for example, is a threat to Utqiaġvik’s grid reliability that CHP could hedge individual facilities against.</td>
<td>227</td>
<td>227</td>
<td>In some of the known alternative energy sources, the energy created may be used either to create power, or heat or both. Energies that are utilized in this way are referred to as CHP energy systems. There are many examples of CHP alternative energies, such as solar, wind, biomass, coal, and natural gas. This potential allows for a more efficient utilization of the energy, and a greater potential for cost effectively integrating into existing heat recovery systems. CHP (e.g. a gas-fired plant in Utqiaġvik or Nuiqsut) has the benefit of increasing power reliability in the event of grid failure, as it enables each building equipped to operate as a de facto microgrid.</td>
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<td>30</td>
<td>TNHA</td>
<td>There are multiple problems with this statement: 1) Photovoltaic output peaks in April in northern latitudes due to clear, cold conditions and ground albedo (snow reflectivity); 2) while summer demand for heat is lower relative to winter, it is still</td>
<td>227</td>
<td>227</td>
<td>Solar power is a source of CHP energy, which makes it attractive, but the primary energy, and the by-product are only available in the summer when the demand is lowest. In NSB, there has not been adequate solar power research and application to show if there are cost effective applications or not. However, TNHA has installed solar thermal collectors</td>
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<td>30</td>
<td>TNHA</td>
<td>[continued] present in this climate region; 3) there is still ample community electric baseload year-round (wastewater processes, etc.) suited to solar generation; and 4) implementation of heat pumps could feasibly provide spring-summer-autumn space heating from PV with little to no reliance on diesel. TNHA has installed solar thermal collectors on 48 residential units across with logging sensors that indicate ample solar resource across the Slope. The conditions present in the NSB are not substantially different than dozens of location across Alaska where solar PV has been successfully integrated. If anything, they tend to be more favorable, due to highly subsidized electricity (NSB’s Power &amp; Light enterprise fund reported a loss of $18,475,939 in 2017 alone), long daylight hours and relatively constant loads. One area where more research is arguably needed is into the viability of bifacial PV modules, which can collect solar radiation from two directions, and therefore offer a production advantage at higher latitudes.</td>
<td>227</td>
<td>227</td>
<td>[continued] on 48 residential units with logging sensors that indicate ample solar resource across the North Slope. Examination of the data from these solar thermal collectors would provide the borough with a better understanding of the viability of solar power in the region.</td>
</tr>
<tr>
<td>31</td>
<td>TNHA</td>
<td>Yes. Participation is crucial.</td>
<td>228</td>
<td>228</td>
<td>NSB should continue to monitor and participate in research and development of solar power systems, as it is likely that cost effective technologies currently exist. Comment acknowledged. No change.</td>
</tr>
<tr>
<td>32</td>
<td>TNHA</td>
<td>Correct, and a reasonable attempt should be made to quantify these costs in the findings of this chapter.</td>
<td>228</td>
<td>228</td>
<td>The majority of the cost is borne by the borough (information on borough subsidies is provided in Chapter 7: Public Facilities)</td>
</tr>
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<td>33</td>
<td>TNHA</td>
<td>Expand: Fuel spills, fines and spill preparedness are additional costs rarely factored into fossil energy costs. The NSB has made headlines with its fuel spills, which are incredibly costly to clean up. Investment in clean energy is sound risk management.</td>
<td>228</td>
<td>229</td>
<td>• Dependence on fossil fuels and logistics of fuel delivery The bulleted list was developed during Strengths, Weaknesses, Opportunities, and Threats (SWOT) workshops. Inclusion here is meant to remind the reader of the issues that were discussed by borough residents. All of these issues are explored within this Comprehensive Plan, albeit not all in the same chapter or section. No changes were made based on this comment.</td>
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<tr>
<td>34</td>
<td>TNHA</td>
<td>Clarify: This majority of savings accrue to the NSB, and these can be passed on to all residents in the form of increased funding for other services.</td>
<td>229</td>
<td>229</td>
<td>Findings - Home weatherization can reduce costs for homeowners and the North Slope Borough yet very few home audits have been performed.</td>
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<td>35</td>
<td>TNHA</td>
<td>Expand: Plus environmental risk of leaks, spills, etc.</td>
<td>229</td>
<td>229</td>
<td>Needs &amp; Challenges - Limited availability of natural gas and infrastructure in most villages requires the use of diesel which must be transported to each village and increases both operational costs and the risk of leaks and spills that cause significant environmental damage.</td>
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<td>36</td>
<td>TNHA</td>
<td>Energy performance contracting is one tool governments can utilize to overcome this.</td>
<td>229</td>
<td>229</td>
<td>Needs &amp; Challenges - Lack of funding prevents necessary upgrades to increase efficiency in metering. As funds become available, upgrade projects are initiated. This section is meant to be a brief summary of the chapter’s contents. Types of contracting that may be more effective to accomplish certain objectives is outside of the scope of this section. No change.</td>
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<td>37</td>
<td>TNHA</td>
<td>Expand: Investment in energy efficiency and weatherization tends to keep more dollars in the community by reducing energy burden on low-income households, freeing up budgets for local goods and services, and by creating local jobs. Energy efficiency is good economic development policy.</td>
<td>229</td>
<td>229</td>
<td>Needs &amp; Challenges - Home weatherization is needed for many of the region’s older housing stock to increase efficiency and reduce costs. While it is true that energy efficiency and weatherization provides many benefits, including the ones provided in this comment, this section is meant to be a brief summary of the chapter’s contents. No change.</td>
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<td>38</td>
<td>TNHA</td>
<td>This should be the third objective, after planning and energy efficiency.</td>
<td>230</td>
<td>230</td>
<td>Goal 9, Objective 1. Develop alternative and redundant energy sources. The objectives are not presented in priority order. No change.</td>
</tr>
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<td>39</td>
<td>TNHA</td>
<td>This should be the first objective, and it should specifically seek to complete the NSB Regional Energy Plan that was suspended in 2015.</td>
<td>230</td>
<td>230</td>
<td>Goal 9, Objective 2. Develop regional energy plans. The objectives are not presented in priority order. No change.</td>
</tr>
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<td>40</td>
<td>TNHA</td>
<td>This should be the second objective, after regional energy planning. If energy efficiency were procured like a fuel, it would almost always be the lowest-cost alternative. Co-benefits such as improved thermal comfort, indoor air quality, and durability should be included in the analysis, where feasible.</td>
<td>230</td>
<td>230</td>
<td>Goal 9, Objective 3. Seek energy efficiency upgrades. The objectives are not presented in priority order. No change.</td>
</tr>
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<td>41</td>
<td>TNHA</td>
<td>TNHA started construction on 24 homes in six North Slope villages on 3/29/13 which were completed by 11/20/15.</td>
<td>235</td>
<td>235</td>
<td>The NSB Census reported in 2015 that 48 housing units were under construction in Utqiagvik but did not report any homes under construction in any other village. However, the regional housing authority, Tagiugmiullu Nunamiullu Housing Authority (TNHA), reported constructing 24 homes in North Slope villages between 2013 and 2015.</td>
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<td>42</td>
<td>TNHA</td>
<td>These numbers reflect HUD homes constructed by TNHA in each village between 2013-2015.</td>
<td>236</td>
<td>236</td>
<td>Under construction (2015) homes added to Table 30: AKP: 4; ATQ 2; KAK: 5; NUI: 5; PIZ: 3; AlN: 5.</td>
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<td>43</td>
<td>Bill Tracey</td>
<td>Housing being one of our biggest concerns – can never say enough – many of today’s homes are already and/or otherwise not suitable for habitation today and especially tomorrow.</td>
<td>237</td>
<td>237</td>
<td>North Slope residents are concerned about the condition of much of the region’s housing stock, including overall condition and age, drafts and ventilation, and type of construction. Residents are concerned that many homes on the North Slope are unsuitable for habitation today and that conditions will be exacerbated in the future without intervention.</td>
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<td>44</td>
<td>TNHA</td>
<td>Clarify: Is this with or without NSB subsidies?</td>
<td>238</td>
<td>239</td>
<td>Energy costs for single-family homes average $4,088 annually... [Footnote added for clarification]</td>
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<td>* The AHFC Assessment methodology reports that energy cost data was obtained from the 2014 AHFC Assessment completed by the Cold Climate Housing Research Center and from the Alaska Retrofit Information System (ARIS) database. Neither of these sources indicate whether or not energy costs include NSB subsidies. This plan assumes that since the NSB was not included as a reference, the energy costs presented do not consider NSB subsidies.</td>
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<td>45</td>
<td>TNHA</td>
<td>Expand: This section would benefit from discussion of heating index: energy usage intensity relative to heating-degree days. Normalized for area and climate, many if not most homes on the North Slope may be as energy intensive or less than their peers in more temperate regions. Even poorly-performing homes on the North Slope tend to be more tightly constructed and insulated than homes further south.</td>
<td>238</td>
<td>239</td>
<td>The extreme weather conditions are likely the reason for much of the increase [of energy costs], although the lack of energy efficient housing could also account for increased usage. Outside the scope of this chapter. No change.</td>
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<td>46</td>
<td>TNHA</td>
<td>Clarify: “Overcrowded housing is a manifestation of what would be unsheltered homelessness in other parts of the country.” (This is quoted from prepared testimony to the Senate Committee on Indian Affairs 8/25/18 by Chris Kolerok, President/CEO of Bering Straits Regional Housing Authority.)</td>
<td>238</td>
<td>239</td>
<td>The rate of overcrowding is a frequently used indicator to assess housing affordability, economic health, and the quality of life within a community. A commonly accepted definition of overcrowding and one used by the United States Census Bureau is more than one person per room; severe overcrowding is defined as one and a half people per room. In rural Alaska, however, homes often become overcrowded because they absorb friends or family members that would otherwise be homeless. As the president/CEO of the Bering Straits Regional Housing Authority, Christopher Kolerok, points out during a 2018 housing forum held in Savoonga, “…unsheltered homelessness would lead to death during the fierce winter weather. Rooted in a close-knit culture and deep familial links, many families prefer to house people in need, and live in severe overcrowding, rather than let individuals risk certain death if they are unsheltered... Overcrowded housing and the lack of housing are interchangeable conditions in rural Alaska. The lack of safe, sanitary and affordable housing threatens the survival of Native cultures and the villages and towns many Alaska Natives call home. For American Indians and Alaska Natives, overcrowded housing is a manifestation of what would be unsheltered homelessness in other parts of the country.”</td>
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<tr>
<td>47</td>
<td>TNHA</td>
<td>TNHA no longer operates an Elder Housing Program. These five-plexes were purchased and are now managed by the NSB.</td>
<td>242</td>
<td>NA</td>
<td>4. North Slope Elder Housing Program. TNHA, through a memorandum of understanding with the NSB, manages one bedroom elder housing five-plexes in several North Slope villages. Elder housing through TNHA is not offered in Utqiaġvik because the NSB Health Department offers senior apartments.</td>
</tr>
<tr>
<td>48</td>
<td>TNHA</td>
<td>Expand: A 2011 CCHRC/NREL monitoring study found electrical usage to be higher than the average Alaska home, at 1100 kWh monthly, but heating fuel usage was 73% lower than a typical rural home.</td>
<td>242</td>
<td>243</td>
<td>The [AKP] home was designed to utilize lightweight materials and energy efficient plumbing and heating systems to significantly reduce energy costs by an estimated 40 percent.</td>
</tr>
<tr>
<td>49</td>
<td>TNHA</td>
<td>Expand: Homebuyer maintenance of these systems, which save the NSB hundreds of thousands of dollars per lot over a standard wastewater service connection, is essential to their proper operation. TNHA is currently planning a new occupant training regime to ensure their success. TNHA has also been in contact with the NSB about these systems; conversations with the planning department about diversion of the effluent that took place prior to their installation were suspended due to administrative turnover at the NSB. The effluent quality of the systems is designed to meet strict environmental regulations.</td>
<td>243</td>
<td>244</td>
<td>Additionally, some residents and the NSB are concerned the use of independent wastewater treatment systems, which discharge effluent is discharged directly onto tundra, often causing environmental issues like odor, erosion, and permafrost thaw. Comment acknowledged. No change.</td>
</tr>
<tr>
<td>50</td>
<td>TNHA</td>
<td>Verify: As far as we’re aware, the Housing Solutions Group is no longer active and/or has been folded into the NSB Housing Department.</td>
<td>243</td>
<td>245</td>
<td>The North Slope Borough created the Housing Solutions Group in 2011 after concerns were raised by both the NSB Assembly and citizens regarding short-term and long-term housing issues region-wide. The Housing Solutions Group provided financial and outreach services as well as collaboration and coordination with housing providers to assist residents in purchasing or constructing a home.</td>
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<tr>
<td>50</td>
<td>TNHA</td>
<td>[continued]</td>
<td>243</td>
<td>245</td>
<td>[continued]</td>
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<tr>
<td></td>
<td></td>
<td>In a more recent response to the housing crisis, NSB resurrected the Housing Department in 2017. When the housing department closed a decade ago, its responsibilities were moved to TNHA. Now the two entities are coordinating the best way to align their funding and programs to have the most benefit for North Slope residents. The functions and activities of the Housing Solutions Group are being transferred to the Housing Department to streamline housing activities within the borough.</td>
<td></td>
<td></td>
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<tr>
<td>51</td>
<td>TNHA</td>
<td>Rephrase: This should be framed as a homelessness problem. Multi-generational households are often attributed to cultural values that prize family ties, but just because people aren’t visible on the streets doesn’t mean they’re not technically homeless.</td>
<td>244</td>
<td>245</td>
<td>There is a housing shortage across the North Slope that often results in multiple generations and families residing in the same household and in overcrowded conditions. A clarification on this issue has already been included. See comment #46. No change.</td>
</tr>
<tr>
<td>52</td>
<td>TNHA</td>
<td>Shipping materials alone is about $150,000 on average per village. TNHA’s total development costs per square foot ranged from $448 (Nuiqsut) to $660 (Point Lay) in 2015 to build 24 homes.</td>
<td>246</td>
<td>248</td>
<td>The cost to construct even a modest home can cost well over $500,000. TNHA reports the total development cost per square foot can range from $448 (in Nuiqsut) to $660 (in Point Lay) or even more; a 1,500 square foot home can cost between $672,000 to $990,000, depending on the village.</td>
</tr>
<tr>
<td>53</td>
<td>TNHA</td>
<td>NAHASDA has largely accomplished what it was designed to in a sense: convey title to an increasing share of Native homeowners, as this chapter previously pointed out. But flat funding and inflation have resulted in fewer new homes to replace those that convey from TDHEs to residents.</td>
<td>246</td>
<td>248</td>
<td>Federal housing subsidies are inadequate for the need. Comment acknowledged. No change.</td>
</tr>
<tr>
<td>54</td>
<td>TNHA</td>
<td>This is a key opportunity. TNHA is currently leading efforts to establish such a coalition.</td>
<td>246</td>
<td>248</td>
<td>The North Slope is one of the few regions in state that does not have a coalition established to address housing and homelessness issues. Comment acknowledged. No change.</td>
</tr>
<tr>
<td>55</td>
<td>TNHA</td>
<td>Roles need to be properly defined by consensus among stakeholders. The NSB’s unilateral decision to resume exercise of housing powers begat confusion.</td>
<td>246</td>
<td>248</td>
<td>Limited collaboration amongst organizations. Comment acknowledged. No change.</td>
</tr>
<tr>
<td>56</td>
<td>TNHA</td>
<td>This creates a general sense of entitlement that harms other service organizations by creating expectations that are impossible to meet.</td>
<td>246</td>
<td>248</td>
<td>Over dependency on the North Slope Borough. Comment acknowledged. No change.</td>
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<tr>
<td>57</td>
<td>TNHA</td>
<td>There are many benefits to this, including increased standardization of equipment across the region. TNHA would welcome the adoption of simplified mechanical and building energy codes to start.</td>
<td>246</td>
<td>248</td>
<td>Building design standards for the Arctic are yet to be implemented and enforced. Comment acknowledged. No change.</td>
</tr>
<tr>
<td>58</td>
<td>TNHA</td>
<td>Good suggestion. Prefabricated housing is expected to gain market share in the US in coming years as quality control standards and the skilled labor market become tighter. This will shift more of the workforce from the jobsite to factories. This could be an economic development opportunity in Utqiagvik: for example, NARL hangars could be converted to factories where workers assemble raw materials year-round into prefabricated building components.</td>
<td>246</td>
<td>248</td>
<td>Construct modular homes on the North Slope that are easier to transport. Comment acknowledged. No change.</td>
</tr>
<tr>
<td>59</td>
<td>TNHA</td>
<td>This is why “overcrowding” needs to be reframed as technical homelessness.</td>
<td>247</td>
<td>249</td>
<td>Alaska State Legislature perceives that there is not a homeless issue on the North Slope. Comment acknowledged. No change.</td>
</tr>
<tr>
<td>60</td>
<td>TNHA</td>
<td>Findings: The low rate of housing availability contributes to the region’s high rate of overcrowding, homelessness, which manifests as overcrowding and puts a strain on many households.</td>
<td>247</td>
<td>249</td>
<td>Comment acknowledged. No change. See comment #46.</td>
</tr>
<tr>
<td>61</td>
<td>TNHA</td>
<td>Findings: Complex land ownership and the borough’s remote location that contribute to the region’s lack of housing availability and affordability as well as the high rates of homelessness and overcrowding.</td>
<td>247</td>
<td>249</td>
<td>Change accepted.</td>
</tr>
<tr>
<td>62</td>
<td>TNHA</td>
<td>This is probably the single most impactful thing that could happen to resolve some of these challenges.</td>
<td>248</td>
<td>250</td>
<td>Goal 3, Objective 1, 3.1.1. Establish a coalition to address housing and homelessness issues on the North Slope to coordinate programs and initiatives. Comment acknowledged. No change.</td>
</tr>
<tr>
<td>63</td>
<td>TNHA</td>
<td>This should be undertaken as part of a broader energy management program to capture and fully leverage the cost savings; see comments on Chapter 10.</td>
<td>249</td>
<td>250</td>
<td>Goal 3, Objective 3, 3.3.1. Support programs that help with weatherization and sustainability measures to reduce home operating costs for water and energy usage. Comment acknowledged. No change.</td>
</tr>
<tr>
<td>64</td>
<td>TNHA</td>
<td>Fully funding the IHBG and Census would be a more effective use of NSB lobbying muscle as long as there are eligible low- and moderate-income households going unserved in the region (and there are). See <a href="http://www.aaahaak.org/advocacy.php">http://www.aaahaak.org/advocacy.php</a>.</td>
<td>249</td>
<td>251</td>
<td>Goal 3, Objective 4, 3.4.3. Advocate state congressional representatives in the United States to seek exceptions to the income limit for federal housing subsidies for rural Alaska. Comment acknowledged. No change.</td>
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### No. | Commenter | Comment | Draft Page | Final Page | Action
---|---|---|---|---|---
65 | TNHA | This should include an evaluation of the Housing First model for chronically unsheltered homeless individuals—data from Juneau support this approach. | 249 | 251 | Goal 3, Objective 5, 3.5.1. Investigate the costs and feasibility of establishing homeless shelters in Utqiagvik and the villages. Comment acknowledged. No change.

66 | Iḷisaġvik College | Expand background on the college | 258 | 260 | The North Slope Borough is also home to Iḷisaġvik College, Alaska’s only Tribal college. The founders of the North Slope Borough were acutely aware of the importance of education to their dreams of sustained self-determination and local control for their people, looking towards the development of a post-secondary educational system that would allow residents to further their educational goals while remaining close to the culture and lifestyle that sustained them. In 1986, the North Slope Borough created the North Slope Higher Education Center, a cooperative effort between the North Slope Borough and the University of Alaska Fairbanks. The North Slope Higher Education Center’s Board and the North Slope Borough Assembly changed the institution’s name to Arctic Sivunmun Iḷisaġvik College in 1991 to reflect its transformation into a community college. Arctic Sivunmun Iḷisaġvik College merged with the NSB Mayor’s Workforce Development Program in 1993, adding facilities and resources to support the growing number of vocational education opportunities available at the college. In 1995, the North Slope Borough established by ordinance the Iḷisaġvik College Corporation, an independent, public, non-profit corporation with full power for governance of the college vested in the Board of Trustees. Iḷisaġvik achieved accreditation from the Northwest Commission on Colleges and Universities in 2003 and is authorized by the Alaska Commission on Postsecondary Education to operate in the state of Alaska. In 2005, it also became the first and today remains the only federally recognized tribal college in Alaska.

67 | Iḷisaġvik College | Iḷisaġvik College serves all the North Slope Borough villages through online classes and in-person classes in Utqiagvik. The college also has a statewide presence; in 2017, Iḷisaġvik reached 40 communities within Alaska through remote learning instruction. During the 2017-2018 school year, Iḷisaġvik made 91 trips to North Slope communities, ensuring every village on the Slope is served and instated the first four-year degree program, a Bachelors in Business Administration.
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<td>68</td>
<td>Bill Tracey</td>
<td>I believe the RLC should have been explained and Iḷisaġvik could have had more depth in its role with the community and why it’s important it be in the village setting. “Links” could be provided for more info.</td>
<td>NA</td>
<td>262</td>
<td>An additional effort to expand educational opportunities on the North Slope is the Residential Learning Center. Students from North Slope villages will be able to seek educational opportunities in Utqiagvik. The students will be housed at the former Top of the World Hotel on the corner of Agvik Street and Stevenson Street. In 2013, Pepes North of the Border restaurant was destroyed in a fire. The attached Top of the World Hotel was suffered significant smoke damage and was closed. ASRC, the hotel owner, donated the building for use as the Residential Learning Center. A design to renovate the former hotel has recently been finalized. The improved building will offer 28 dormitory rooms for two students each and two for one student each. It will also have living space for residential advisors, an office, kitchen facility, dining room, and sitting and study areas.</td>
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| 69  | Iḷisaġvik College| Clarification on new education facilities.                              | 259        | 262        | Future Education Facilities  
Iḷisaġvik College has long sought a new campus in Utqiagvik or Browerville. Over a decade ago, the Iḷisaġvik College Board of Trustees directed college leadership and staff to explore options for a new Iḷisaġvik College campus. The current facility was built as the Naval Arctic Research Laboratory, now over 70 years of age and was never meant to house a college campus. The current site is host to numerous environmental and logistical concerns; located three miles outside of town, students may be challenged in connecting with the community. The facility that the college is housed in at NARL is over half a century old and requires significant renovations. Its isolated location northwest of Browerville does not allow it to integrate into the community. During severe storm events, the road to NARL can be overtaken by flooding or be washed out, further isolating the college from the community. As such, Iḷisaġvik College has assembled a team to bring this project into fruition. The site selected by the Iḷisaġvik College Board of Trustees is south of the Samuel Simmonds Memorial Hospital. However, the cost of a new campus has been cost prohibitive for the North Slope Borough. |
<p>| 70  | Iḷisaġvik College| Clarification on potential for a Deadhorse education facility.          | 259        | 262        | Because on-site training, internships, and apprenticeships may also be more readily available in the Prudhoe Bay region than in the villages of Utqiagvik, developing an educational / training center located in Deadhorse may present new opportunities for North Slope residents. |</p>
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<td>71</td>
<td>Ilisagvik College</td>
<td>Include a statement about the need for new facilities as awareness and discussions on the arctic increase.</td>
<td>NA</td>
<td>263</td>
<td>With the growth of national and international awareness and discussion regarding opportunities with Northern shipping and transportation, energy and defense, new facilities are needed to host these conversations about America’s Arctic, in America’s Arctic. The growth of essential infrastructure is necessary to meet the needs of the North Slope, Alaska, and our nation at large.</td>
</tr>
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<td>72</td>
<td>NSB Planning</td>
<td>Reference to Armstrong Energy should be changed to Oil Search, who bought out Armstrong’s interest in Nanushuk.</td>
<td>282</td>
<td>286</td>
<td>Armstrong Energy-Oil Search’s Nanushuk project in the Pikka Unit is expected to produce 120,000 barrels per day.</td>
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<td>73</td>
<td>ASNA</td>
<td>Update service information</td>
<td>295</td>
<td>299</td>
<td>In August 2013, the new Samuel Simmonds Memorial Hospital officially opened. The 109,000 square foot structure is four times larger than the 1965-1969 facility that it replaced. Healthcare services at Samuel Simmonds Memorial Hospital include: Samuel Simmonds Memorial Hospital is a licensed 14-bed critical access hospital, also certified as a Level IV Trauma Center. It features: 14 outpatient exam rooms unit providing emergency, clinic and urgent care (15 outpatient and 4 emergency rooms); 10 single inpatient rooms, including two labor and delivery rooms inpatient unit providing care for newborn through elderly patients, including low-risk obstetrical services with two labor and delivery rooms; Four emergency beds; Physical therapy; Computed tomography (CAT) scan; Eye clinic; Case management; Specialty clinics offering access to specialists by referral; “Screening for Life” Breast and Cervical Cancer Screening Program (mammography is offered at the Wellness Center); Diabetes education; Physical Therapy; Optometry; Pharmacy; Audiology and endoscopy services. SSMH also provides specialty outpatient clinics and services: Arthritis; Audiology; Cardiology; Diabetes; Ear, nose, and throat; Gynecology; Hepatitis; Neurology; Ophthalmology; Orthopedics; Pediatrics; Pediatric cardiology; Podiatry; Surgery; and Sleep. Meditation room. Support services provided by the Hospital include: Central sterile supply; Medical records; Business office; Translation services; and Eye care (currently being transferring from the NSB Health Department to ASNA); and Morgue. ASNA also administers a pre-maternal home at 274 Pisokak Street 6196 Herman Street in Utqiagvik. ASNA would prefer that this facility be located adjacent to the hospital in the future.</td>
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<td>74</td>
<td>ASNA</td>
<td>Provide information on the health services agreement</td>
<td>NA</td>
<td>300</td>
<td>Through a health services agreement, ASNA and NSB CHAP collaborate to manage healthcare delivery. SSMH clinicians provide medical oversight for the frontline care provided by the village health aides (excluding Anaktuvuk Pass and Point Hope). In addition, after initial Alaska Native Tribal Health Consortium (ANTHC) training, ASNA provides orientation, evaluation for certification, and preceptorships (one-on-one shadowing with a provider) for NSB CHAP. Scheduled medical and dental provider visit each village every year (excluding Point Hope and Anaktuvuk Pass).</td>
</tr>
<tr>
<td>75</td>
<td>Bill Tracey</td>
<td>Heath. Many examples of efforts to man our clinics did not panned out over time. PAs at each site, health aides from afar, etc. It will take all of the above to make it work.</td>
<td>296</td>
<td>300</td>
<td>There have been difficulties over the years keeping the village health clinic adequately staffed with community health aides. Many are hired from out of the area on a rotational basis. Others are community members. Without sufficient staffing resources, local health aides may feel the stress of providing service for an entire community.</td>
</tr>
<tr>
<td>76</td>
<td>ASNA</td>
<td>The Pre-Maternal Home, located at 6196 Herman Street, is open for women and children referred by Samuel Simmonds Memorial Hospital. The Pre-Maternal Home serves as a temporary “home away from home” for pregnant women and their children. It is a five-bedroom house with five bathrooms and an office space, full kitchen, washer/dryer, and comfortable living space. The pre-maternal home opened in June 2013 and is located at 274 Pisokak Street in Utqiaġvik. It serves as a temporary home for pregnant mothers and their families that come to Utqiaġvik from North Slope outlying villages. Through grant support, the ASNA pre-maternal home was able to provide free educational classes for Arctic Slope residents, receive upgrades to the facility, and provide trainings and opportunities to women and children on prenatal care and nutritional information.</td>
<td>298</td>
<td>303</td>
<td>The North Slope Borough participates in a Mutual Aid Program in partnership with the oil and gas industry. The program includes field testing and training as well as oil spill scenarios to determine response and resource gaps. The exercises are held annually in Prudhoe Bay.</td>
</tr>
<tr>
<td>77</td>
<td>NSB Planning Department</td>
<td>There needs to be a discussion here about the North Slope Borough’s agreement and participation the Mutual Aid Program with the Oil Industry. The NSB is signatory to this agreement and they participate in Mutual Aid Drills that tests the ability for the oil industry to respond to large oil spills.</td>
<td>NA</td>
<td>307</td>
<td>A map of SA-10 contaminated sites is included, Map 18.</td>
</tr>
<tr>
<td>79</td>
<td>Planning Team</td>
<td>Incomplete reference</td>
<td>317</td>
<td>323</td>
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*italics are additions; strikethroughs are deletions*
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<td>80</td>
<td>NSB Planning Department</td>
<td>Include the other official zoning maps to show the example of Barrow Zoning, Science Research and Village Districts.</td>
<td>327</td>
<td>330</td>
<td>Maps 19 and 20 are official zoning maps for the Resource Development District and Utqiagvik. The entirety of the North Slope’s seven rural villages are within the Village Zoning District. Maps 24 - 32 now include the zoning districts for North Slope communities. The official Utqiagvik Zoning Map is also included as Map 20.</td>
</tr>
<tr>
<td>81</td>
<td>NSB Planning Department</td>
<td>There is no label on the mineral dot to the far right on Map 33 – Future Regional Land Use.</td>
<td>368 – 369</td>
<td>372 - 373</td>
<td>A label has been added (now Map 37).</td>
</tr>
<tr>
<td>82</td>
<td>NSB Planning Department</td>
<td>Put legends on the NSB Land Use maps.</td>
<td>362 - 365</td>
<td>367 - 370</td>
<td>Legends have been added to maps 34 - 36.</td>
</tr>
<tr>
<td>83</td>
<td>Mamie Pardue</td>
<td>With the recognition that more youth across the NSB, what kinds of activities or opportunities can be brought up to help them succeed in their futures? How do we build structures to ensure they have the space to express their interests and talents. Can anything be done immediately to job ready and successful once out of high school. We have more children now more than ever. The rise of youth is not slowing down. Having individuals who could help youth keep hunting/fishing, knowing our surroundings by land and boat is important. The NSB School District has been doing introductions to our NSB. Giving information about our culture. More of this could be taught to our youth as well. As the years go by, it seems time is not being spent on teaching our youth about living off the land. The importance of this needs to be addressed. Our villages are in need of keeping our youth busy so they are not doing drugs or drinking alcohol at young ages.</td>
<td>NA</td>
<td>NA</td>
<td>Village comprehensive plans include a discussion on recreation and school space needs specific to each community. This plan includes a discussion of the cultural curriculum used by the NSBSD as well as goals, objectives, and strategies to further youth involvement cultural and subsistence activities.</td>
</tr>
<tr>
<td>84</td>
<td>Roger Ahnupkona</td>
<td>I want you or North Slope Borough to loop up house 113 Coldvill Street to see my electric problem and the outside of the place is getting of about 4” down if you or your department can come over and take a time to look throughout the house 113 Coldvill Street.</td>
<td>NA</td>
<td>NA</td>
<td>This is outside the scope of this plan. However, the comment has been forwarded to the NSB Administration.</td>
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<td>85</td>
<td>Marjorie Long</td>
<td>1. I’d like our rep – planning for Point Lay be involved with anything involved with Cully Corp. 2. Get more high schools involved with any NSB meetings in the future invite them. 3. Point Lay resident families are happy NSB houses are going to the community. But we should not get getting homes that are already 10-15 years old. They will have a lot of problems. So I’d like to see new homes for Point Lay residents. 4. Help renovate and make bigger store for Point Lay is growing. 5. Come to school and ask what our school needs. I know for fact classrooms are overloaded with kids need bigger classrooms.</td>
<td>NA</td>
<td>NA</td>
<td>Many of these issues are discussed to each community comprehensive plan. Additionally, these comments have been forwarded to the North Slope Borough Administration.</td>
</tr>
<tr>
<td>86</td>
<td>Kimberly Neakok</td>
<td>House Bill 216 passed in April 2014 recognizing the 20 indigenous languages as official languages for the state. More recently, this last April then legislation declared the decline of Native languages an emergency. My daughter was born in 2016 and the State of Alaska will not recognize her name on her birth certificate or state documents because it is spelled with an Iñupiaq atchanat. Names are significant and often hold great meaning to families. The special characters change the meaning of the word. I have written letters to senators, representatives, and spoken to Commissioner Johnson in person, but I am only one voice. I am asking as a borough, a collective voice, pressure the state to recognize the atchanat on birth certificates and state documents.</td>
<td>NA</td>
<td>NA</td>
<td>This is outside the scope of this plan. However, the comment has been forwarded to the NSB Administration.</td>
</tr>
<tr>
<td>87</td>
<td></td>
<td>Page 24 NSB boundary. Older maps show boundary ends after AIN. Page 62 – 63. Map. Page 109. Need new map boundary lines.</td>
<td>NA</td>
<td>NA</td>
<td>The boundaries shown on the Vicinity map is the official NSB boundary. The boundary on Map 3 is the Area of Influence for the NSB – the compilation of all the village areas of influence as well as areas outside of the borough boundary, such as Hanna Shoal, Ambler Mining District, and offshore oil and gas leases. Activities in these areas impact, or influence, residents of the North Slope.</td>
</tr>
</tbody>
</table>