

# **Barrow Area-Wide Comprehensive Economic Development Strategy CEDS 2018-2023**



**Compiled by Andreas Tziolas, CEDS Project Manager,  
Native Village of Barrow Department of Economic Development**

**Version 1.2, April 2020**

## **CEDS Stakeholder Organizations**

Native Village of Barrow  
Ukpeagvik Iñupiat Corporation  
Arctic Slope Regional Corporation  
North Slope Borough  
City of Utqiagvik  
Iñisaġvik College

Sponsored by the US Economic Development Administration Grant Award #07-84-07382

## VERSION CONTROL

VERSION	DATE	AUTHOR	NOTES
0.1	20th Aug, 2018	A. Tziolas	First draft released for public comment.
0.2	23rd Aug, 2018	A. Tziolas	Added: <ul style="list-style-type: none"> <li>• Action 1.1. Barrow Housing Master Plan</li> <li>• Goal 3 Added details and information to</li> <li>• 4.4 Implementation Strategy Introduction</li> </ul>
0.3	27th Aug, 2018	A. Tziolas	Added: <ul style="list-style-type: none"> <li>• 2.1 Demographic information added images</li> <li>• 3. SWOT analysis Introduction, explanation</li> </ul>
0.4	14th Sept, 2018	A. Tziolas	2. Summary Background section developed further and cleaned up. (80% completion)
0.5	21th Sept, 2018	A. Tziolas	2. Summary Background: Permafrost, Natural Gas, Gravel, Climate and Geographical completed (90% completion)
0.6	24th Sept, 2018	A. Tziolas	2. Summary Background: Transportation, Services, Recreation, Caribou, Historical sites completed, (100% completion)
0.7	3rd October, 2018	A. Tziolas	Added: <ul style="list-style-type: none"> <li>• (re-added) Shareholder Lot Roads Phase 2-5 which was lost on the editing floor.</li> </ul> Removed: <ul style="list-style-type: none"> <li>• projects relating to marine animal businesses and hunting, to avoid conflicts with subsistence rights, at the request of NVB Council.</li> </ul>
<b>1.0 FINAL</b>	16th October, 2018	A. Tziolas	Updated values of CNG, Gasoline, Diesel. p.29
<b>1.1</b>	1st February, 2019	A. Tziolas	Added Operation of Grocery store, Purchase of Mixed Residential/Commercial properties in Barrow for future development. p.59
<b>1.2</b>	1st April, 2020	A. Tziolas	Added emergency planning actions in response to diseases, re: covid-19 epidemic. p.73

For questions, feedback or printed copies of this plan please contact Andreas C. Tziolas, NVB CEDS Program Director, [atziolas@nvbarrow.net](mailto:atziolas@nvbarrow.net) at (907) 301-2160 or call the Native Village of Barrow directly at (907) 852-4411.

# TABLE OF CONTENTS

<b>1. EXECUTIVE SUMMARY</b>	<b>5</b>
<b>2. SUMMARY BACKGROUND</b>	<b>6</b>
2.1 DEMOGRAPHIC DATA	6
2.1.1 Location	6
2.1.2 Demographics	9
2.1.3 Labor Force Characteristics	10
2.1.4 Educational Attainment	11
2.2 ENVIRONMENTAL DATA	12
2.2.1 Wetlands	12
2.2.2 Permafrost	13
2.2.3 Climate	14
2.2.4 Geographical Considerations	15
2.2.5 Wildlife	16
2.2.6 Caribou / Reindeer Herds of the Arctic	17
2.2.7 Cultural Resources and Historic Preservation	18
2.3 INFRASTRUCTURE ASSETS	19
2.3.1 Energy, Water and Sanitation Utilities	19
2.3.2 Solid Waste Disposal and Landfills	20
2.3.3 Telecommunications / Broadband	21
2.3.4 Transportation	22
2.3.5 Emergency Services	23
2.3.6 Recreational Facilities	23
2.4 INDUSTRY CLUSTERS	24
2.5 ECONOMIC RELATIONSHIPS	26
2.6 FACTORS AFFECTING ECONOMIC PERFORMANCE	27
2.7 OTHER FACTORS	28
2.7.1 Housing	28
2.7.2 Health, Safety and Social Services	29
2.8 NATURAL RESOURCES	30
2.8.1 Barrow Gas Fields	30
2.8.2 Gravel	32
<b>3. SWOT ANALYSIS</b>	<b>34</b>
3.1 STRENGTHS	37
3.2 WEAKNESSES / CONCERNS	38
3.3 OPPORTUNITIES	39
3.4 THREATS	40

3.5 BIG IDEAS	41
<b>4. STRATEGIC DIRECTION / ACTION PLAN</b>	<b>42</b>
4.1 STRATEGIC DIRECTION	42
4.2 VISION STATEMENT	43
4.3 GOALS AND OBJECTIVES	44
GOAL 1: FOSTER A DIVERSITY OF SAFE & AFFORDABLE HOUSING	44
Objective 1.1: Create Barrow Housing Master Plan	44
Objective 1.2: Create New Low and Very-Low Income Housing	45
Objective 1.3: Create Homeless Shelter	46
Objective 1.4: Create Family Homes and Apartments for Skilled Workers	47
Objective 1.5: What does a Modern Alaskan Home in the High Arctic Look Like?	48
GOAL 2: CREATE NEW ROADS AND ROAD CONSTRUCTION METHODS	49
Objective 2.1: Shareholder Lot Roads Phase 2-5	49
Objective 2.2: Complete the Uivaqsaagiak Road (BARC Road)	50
Objective 2.3: Research and Develop New Methods for Building Arctic Roads	51
Objective 2.4: Barrow Walkway and Sidewalks Project	52
Objective 2.5: Planning a Permanent Road to Atqasuk	53
GOAL 3: PROMOTE AND EXPLORE NEW BUSINESS DEVELOPMENT	54
Objective 3.1: Barrow Economic Development Corporation	54
Objective 3.2: Repository of Business Opportunities	55
Concept 3.2.1: Barrow Shopping Mall	55
Concept 3.2.2: Movie Theater	55
Concept 3.2.3: Cozy Coffee Shop	56
Concept 3.2.4: Conference Center	56
Concept 3.2.5: Nice Restaurant, Pizza and/or Burger Place	57
Concept 3.2.6: Recycling Station	57
Concept 3.2.7: Hydroponic Farm Business	58
Concept 3.2.8: Indoor Activity Grounds for Kids	58
Concept 3.2.9: Child Care and Day Care Centers	59
Concept 3.2.10: Substance Abuse Center and Jail	59
Concept 3.2.11: Develop Business of Local Grocery Store in Barrow	60
Concept 3.2.12: Purchase Mixed use Commercial Space in Barrow	60
GOAL 4: EDUCATIONAL PROGRAMS FOR SUBSISTENCE AND INDUSTRY	61
Objective 4.1: Build New Campus for Iḷisaḡvik College	61
Objective 4.2: Reindeer Herding Revitalization Project	62
GOAL 5: GROW THE TOURISM INDUSTRY IN BARROW	63
Objective 5.1: Visit Barrow: Eco-Tourism Center	63
GOAL 6: ARCTIC MARITIME LOGISTICS STUDY	64

Objective 6.1: Planning for The Barrow Deep Sea Port	64
GOAL 7: INVEST IN ALTERNATIVE FUELS AND ENERGY	65
Objective 7.1: Investments in Compressed Natural Gas (CNG)	65
Objective 7.2: Wind and Solar Feasibility Projects	66
GOAL 8: BROADBAND INFRASTRUCTURE INVESTMENTS	67
Objective 8.1: Microwave Internet Backhaul Network	67
Objective 8.2: Barrow Datacenter: "US Arctic Data Fortress"	68
4.4 IMPLEMENTATION STRATEGY	69
<b>5. EVALUATION FRAMEWORK</b>	<b>71</b>
<b>6. ECONOMIC RESILIENCE</b>	<b>72</b>
6.1 Planning and Implementing Economic Resilience	72
6.2 Establishing Information Networks	75
<b>APPENDIX A. CEDS COMMITTEE ROSTER</b>	<b>76</b>
<b>APPENDIX B. PUBLIC COMMENTS</b>	<b>77</b>
<b>APPENDIX C. SWOT MEETINGS DETAIL RESPONSES</b>	<b>78</b>
<b>APPENDIX D. NVB RESOLUTION ADOPTING CEDS 2018</b>	<b>79</b>

# 1. EXECUTIVE SUMMARY

The Native Village of Barrow (NVB) Iñupiat Traditional Government is responsible for developing the region-wide Comprehensive Economic Development Strategy (CEDS) for Utqiagvik (Barrow). The CEDS is an actionable plan for creating opportunities for economic growth and for strengthening economic resilience through the collaboration of regional stakeholders.

The NVB Department of Economic Development, towards achieving this goal, formed a CEDS Advisory Committee comprised of the NVB, Arctic Slope Regional Corporation (ASRC), Ukpeagvik Iñupiat Corporation (UIC), City of Utqiagvik (City), Iḷisaḡvik College, North Slope Borough (NSB) and a number of small business representatives.

Meetings were conducted between February 2018 and July 2018, with 60 participants to determine Strengths, Weaknesses, Opportunities and Threats (SWOT meetings) at the offices of each major stakeholder. The SWOT and strategic advisory meetings included discussions on:

- A. Economic Resilience, defined as "the ability of an economic region to prevent, withstand and quickly recover from major disruptions to its economic base", and
- B. Vision, Goals and Objectives towards achieving those goals which leverage strengths and address areas of concern, while working towards the creation of new opportunities.

The SWOT analysis was weighed against the highest risks to the economic base. The resulting Action Plan represents the strategic priorities for the region, and includes the following Goals:

- Goal 1: Foster A Diversity Of Safe & Affordable Housing
- Goal 2: Create New Roads And Road Construction Methods
- Goal 3: Promote And Explore New Business Development
- Goal 4: Educational Programs For Subsistence And Industry
- Goal 5: Grow The Tourism Industry In Barrow
- Goal 6: Arctic Maritime Logistics Study
- Goal 7: Invest In Alternative Fuels And Energy
- Goal 8: Broadband Infrastructure Investments

The overall goal of this Barrow Comprehensive Economic Development Strategy is to respect our rich culture and traditions and act on opportunities for economic development to create new revenue streams, grow a diverse workforce and improve the safety and health of all Barrow residents.

## 2. SUMMARY BACKGROUND

In this section, we provide an abridged look at Barrow Region economic state and potential. We refer the reader to the 2015 NSB Barrow Comprehensive Plan<sup>1</sup> and the 2015 NSB Economic Profile and Census Report<sup>2</sup> and the NSB 2010 Snapshot<sup>3</sup> for complementary information.

### 2.1 DEMOGRAPHIC DATA

#### 2.1.1 Location

Utqiagvik (Barrow), Alaska is the northernmost city in the United States and the nerve center for government and oil exploration operations in the North Slope. Historical evidence shows area inhabited by Iñupiat Eskimos for 4,000 years with archaeological findings dating back 50,000 years.

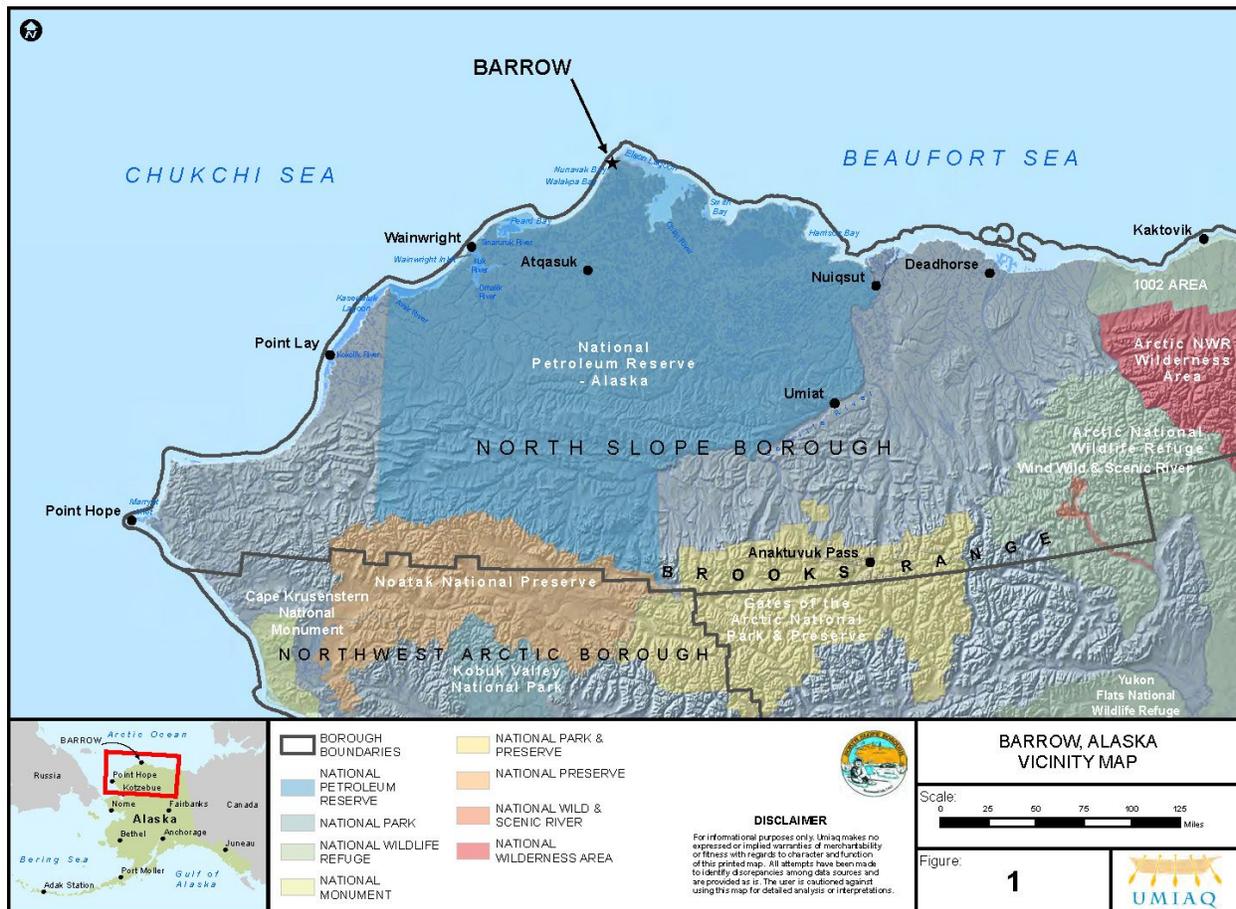


Image 1: Utqiagvik (Barrow), Alaska is the northernmost city in the United States

<sup>1</sup> [http://www.north-slope.org/assets/images/uploads/Barrow\\_Comp\\_Plan\\_March\\_2015\\_FINAL.pdf](http://www.north-slope.org/assets/images/uploads/Barrow_Comp_Plan_March_2015_FINAL.pdf)

<sup>2</sup> [http://www.north-slope.org/assets/images/uploads/NSB\\_Economic\\_Profile\\_and\\_Census\\_Report\\_2015\\_FINAL.pdf](http://www.north-slope.org/assets/images/uploads/NSB_Economic_Profile_and_Census_Report_2015_FINAL.pdf)

<sup>3</sup> [http://www.north-slope.org/assets/images/uploads/North\\_Slope\\_Borough.pdf](http://www.north-slope.org/assets/images/uploads/North_Slope_Borough.pdf)

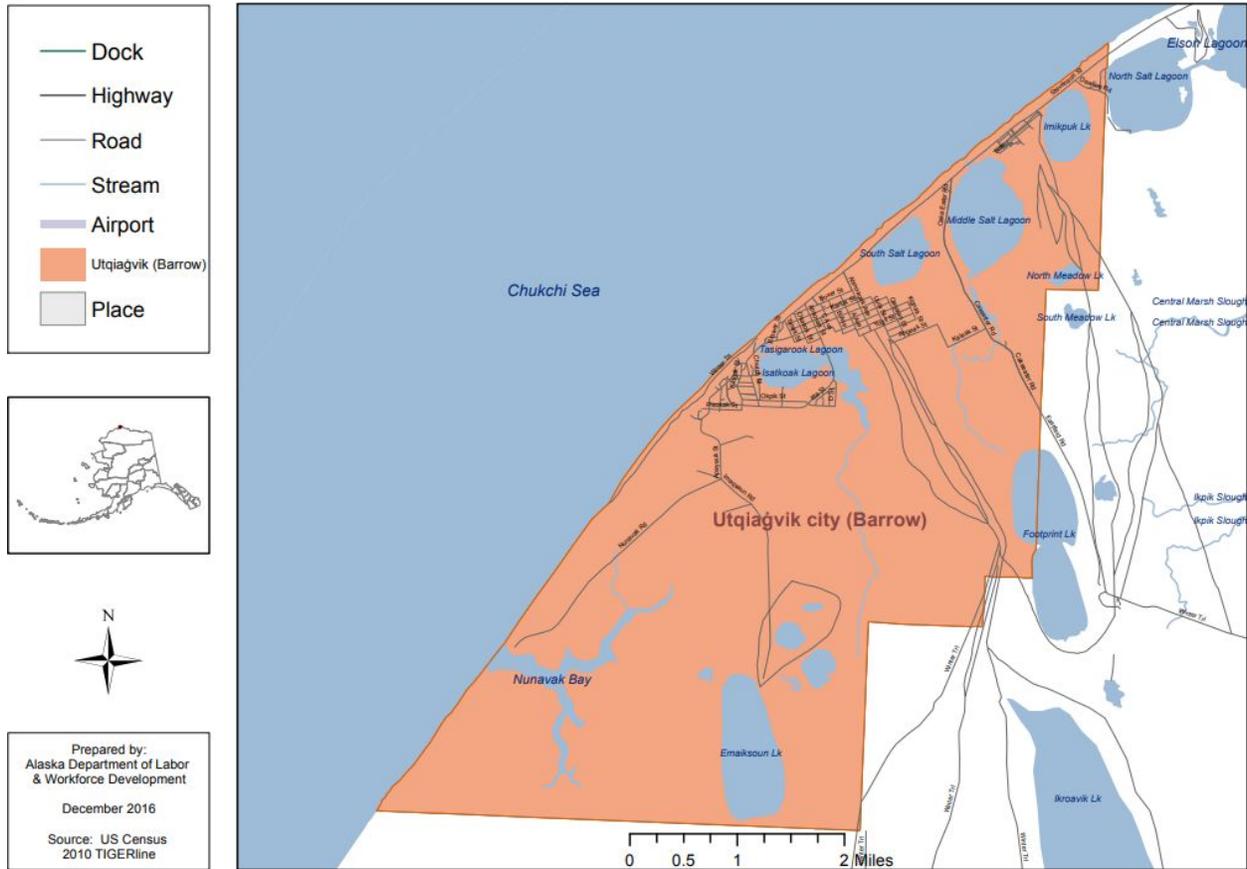


Image 2: *Utqiagvik City (Barrow) Area map. The majority of land (220,000 acres) is owned by the Ukpeagvik Iñupiat Corporation (UIC), the ANCSA designated village corporation for Barrow<sup>4</sup>.*



Image 3: *Bowhead jaw bones and skin boats provide a dramatic photo opportunity for tourists.*

<sup>4</sup> <http://live.laborstats.alaska.gov/cen/maps/place/current/05200.pdf>



Image 4: *Three distinct areas make up the City of Utqiagvik, from South to North: Barrow (commercial), Browerville (residential) and NARL (Naval Arctic Research Lab).*



Image 5: *Typical summer view of Barrow, showing packed dirt roads, single and double story construction homes and commercial spaces. There are a number of abandoned vehicles in a state of disrepair, with no place for them to go, as there is no road access to Barrow.*

## 2.1.2 Demographics

Table 1: Snapshot of Barrow's Population

Barrow Population	Lower (no oil)	Higher (w/ oil)	increase	Ethnicity	Percent
2015	5,176	5,176		Iñupiat	65%
2025	5,600	6,700	20%	Caucasian	16%
2035	6,400	7,400	16%	Filipino	8%
				Pacific Islander	2%
<b>Poverty % (2018<sup>5</sup>):</b>	18%			Other	9%

Barrow is the economic center of the North Slope. Between the NSB and their School district employees, a total 65% of the population is dependent on government employment which is subsidized by oil sectors dollars through taxation. The community needs to address how to move employment into the private sector.

Barrow enjoys a healthy ethnic diversity. Poverty levels have been consistent over the last 20 years ranging from 15-19%. Population projections relying heavily on Oil and Gas Exploration are so dramatic they can account for up to 20% population change over the next two decades.

According to the census from the North Slope Borough, the number of individuals with permanent employment declined from 1,461 in 2003 with a 16.2% unemployment rate to 1,128 in 2010 with a 25.7% unemployment rate. Essentially four out of ten Iñupiat are employed full-time while every other ethnicity has roughly twice this proportion of full-time employment with Caucasians, Filipinos and "Other" ethnicities having eight out of ten individuals with full-time employment.



Image 6: Subsistence activities, such as hunting and berry picking are both a cultural way of life and a necessity for many families in Barrow. The high cost of living makes hunting and fishing for whale, seal, walrus and caribou necessary for many to provide food for their families.

<sup>5</sup> <https://aspe.hhs.gov/poverty-guidelines>

### 2.1.3 Labor Force Characteristics

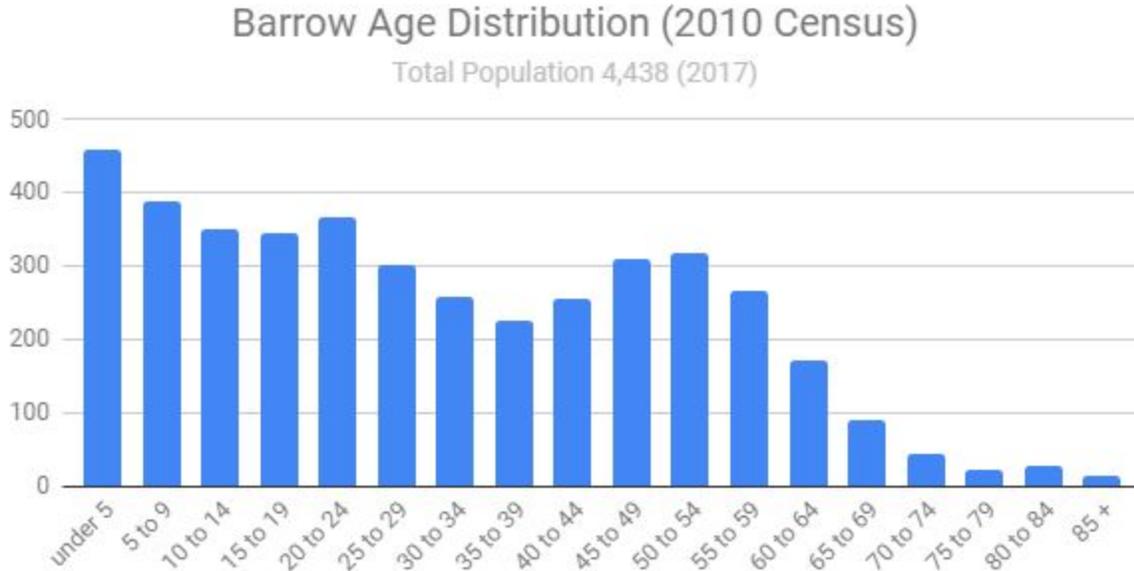


Image 7: 4,438 Total Population (US Census 2017 estimate)<sup>6</sup>. Federal and local (NSB, NVB) population and housing data have been found to be in conflict, often with over 20% variance.

The NVB Housing department has a new data collection effort underway. ([Source: Alaska Department of Labor & Workforce Development \(2016\)](#))

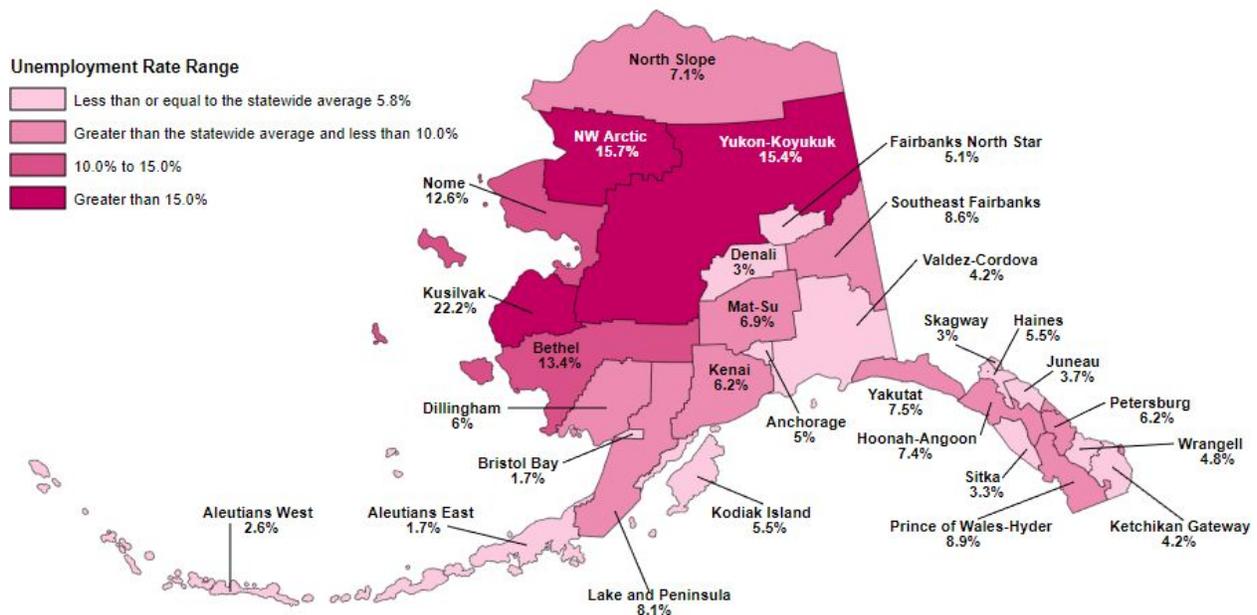


Image 8: Alaska 2018 Unemployment Rates. The Aleutians and Bristol Bay are the lowest with 1.7%, while the NSB is 7.1% compared to Alaska's 7.3% (March 2018). In comparison, Barrow has 11% unemployment.

<sup>6</sup> [https://factfinder.census.gov/faces/nav/jsf/pages/community\\_facts.xhtml?src=bkmk](https://factfinder.census.gov/faces/nav/jsf/pages/community_facts.xhtml?src=bkmk)

## 2.1.4 Educational Attainment



**Image 9:** *Ilisagvik College is the only tribal college in Alaska and a strong supporter of workforce development and cultural preservation. The campus is currently located at NARL and running out of room to grow, and is working on a constructing a campus.*

### Post-Secondary Education

- Tribal College: Ilisagvik College: Established in 1995, Ilisagvik College, the only tribal college in Alaska, offers post-secondary academic, vocational and technical education aimed at matching workforce needs. They are dedicated to perpetuating and strengthening Iñupiat (Eskimo) culture, language, values and traditions. (257 students)
- ICAS Vocational Rehabilitation Program: This program helps those Alaska Natives and American Indians whose physical and mental disabilities substantially impede their ability to get or keep a job, or be productive in subsistence activities.

### Secondary and Elementary Schools

- Barrow High School (214 students)
- Eben Hopson Sr., Memorial Middle School (196 students)
- Kiita Alternative Secondary School: seeks to help students who have dropped out or who fallen seriously behind in traditional schools earn academic credits. (42 students)
- Ipalook Elementary School (608 students)

Adequate Yearly Progress<sup>7</sup> (AYP) is based on tests that all public school students take each year, which measure their proficiency in reading, writing and math. Three out of four schools did not pass the AYP in Barrow, and the North Slope Region's (all villages) dropout rate has been steadily increasing. A study is needed to understand these results and correct them.

---

<sup>7</sup> [https://en.wikipedia.org/wiki/Adequate\\_Yearly\\_Progress](https://en.wikipedia.org/wiki/Adequate_Yearly_Progress)

## 2.2 ENVIRONMENTAL DATA

The North Slope is 99% wetlands, with permafrost permeating down to bedrock at 70-100 feet, essentially a triple threat to all development, as

- A. damage to wetlands needs to be mitigated,
- B. disruptions to permafrost needs to be minimized and
- C. high quality gravel sources are few and far apart.

This makes housing, road construction and commercial development incredibly costly in Barrow. Managing and overcoming them also presents opportunities for economic development and resilience.

### 2.2.1 Wetlands

Some 98% of the land in the North Slope are designated wetlands. Comparatively, Alaska as a whole has 43% wetlands and is a significant environmental asset to plant and animal species which depend on such environments and which are an essential part of subsistence activities. At the sale time, the communities in the North Slope can be said to be disproportionately affected by wetlands regulations where commercial and road construction is needed.

State	% Wetlands
North Slope	98%
Alaska	43%
Georgia	20%
Minnesota	19%
North Carolina	14%
Mississippi	13%
Connecticut	5%
New Hampshire	5%
Virginia	4%
Hawaii	3%
Illinois	2%

The Army Corps of Engineers (USACE) determines the mitigation or compensation rates on a case-by case basis and has the authority to block development of certain parcels. Wetland mitigation/compensation is in the form of:

**1. Mitigation Banks**, where land of equal value is set aside elsewhere to compensate for the proposed loss of wetlands. Currently, no Alaska District Approved Mitigation Banks are available to serve Barrow, although UIC UMIAC is in the process of developing such an instrument.

**2. In-Lieu Fee for Mitigation**, where the developer pays an up-front monetary cost, where funds are used by the USACE to improve wetlands elsewhere. The Conservation Fund Alaska outlines typical costs<sup>8</sup>.

**3. Permittee-Responsible Mitigation**, where the developer commits to wetlands improvements on or near the surrounding area. In this case the developer gains credits for improving low performing wetlands, creating new wetlands or preventing future damage by creating walkways, paths and roads which preserve the arctic tundra.

<sup>8</sup> [Alaska In-Lieu Fee Compensatory Mitigation Program Instrument](#)

## 2.2.2 Permafrost

Permafrost is comprised of soil and rocks which have remained frozen for over 2 years. Permafrost in the arctic can date back thousands of years and reaches depths of hundreds to thousands of feet<sup>9</sup>. While the top layers thaw and refreeze annually, if permafrost is disturbed this active layer can begin to penetrate deeper and deeper into the ground causing the surface to lose its load bearing capacity. Ice-Rich permafrost is soil which has absorbed significant amounts of water and loses its cohesion much more dramatically during thaw-freeze cycles.

To avoid damaging the permafrost, construction in the Arctic which involving land surfacing, installation of pilings or placement of gravel pads is conducted during the winter. Thermosyphons are installed where possible, especially on structures which produce a significant amount of heating.

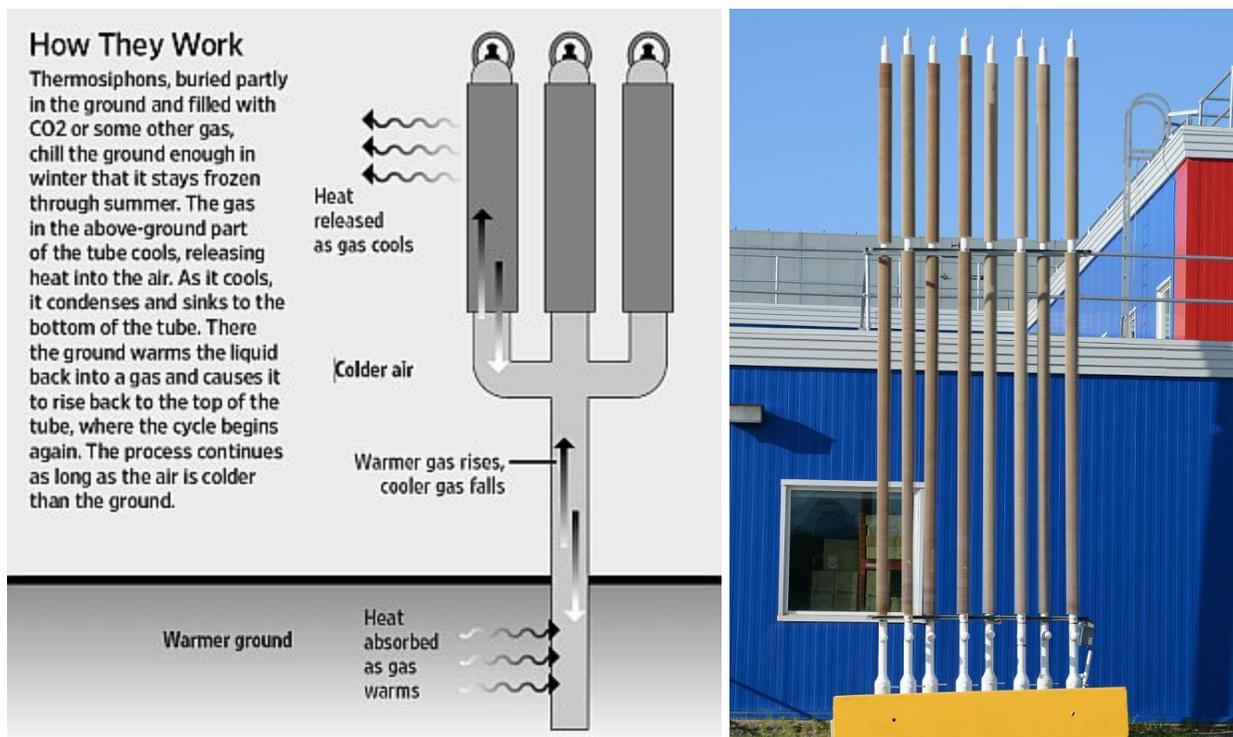


Image 10: *Passive thermosyphons are used to keep the permafrost frozen when a building needs to be placed on pad. Alternatively the building is placed on pilings to avoid heat*

Culverts and surface drainage paths have complex interactions with permafrost especially around city limits. Addressing snow drifts, storm drains and overflows due to coastal erosion require detailed engineering hydrological assessments with technical expertise combined with local indigenous knowledge of local conditions.

<sup>9</sup> [McCarthy, K.A., Solin, G.L. and Trabant D.C., "Assessment of the Hydrologic Interaction Between Imikpuk Lake and the Adjacent Airstrip Site Near Barrow, Alaska, 1993", USGS \(1994\)](#)

### 2.2.3 Climate

Temperatures remain below freezing from early October through late May. There are freezing temperatures on an average of 324 days per year. On November 18 or 19 the sun goes down, and remains below the horizon for about 65 days until it re-appears, normally on January 22 or January 23.

Atmospheric changes and emissions of harmful trace chemicals from industry from around the world can be measured in the arctic.

In 1992, UIC set aside 7,400 acres of private land for scientific research, creating the Barrow Environmental Observatory. This site is used by a number of national research laboratories and is the longest running atmospheric sensing and monitoring location in the United States and most of the world. The National Weather Service (NWS) Office and National Oceanic and Atmospheric Administration (NOAA) Climate Monitoring Lab are located in Barrow, and the Barrow Arctic Research Center (BARC) is a state of the art facility accommodating such studies, including wildlife investigations. Weather observations are available for Barrow dating back into the late 1800s.

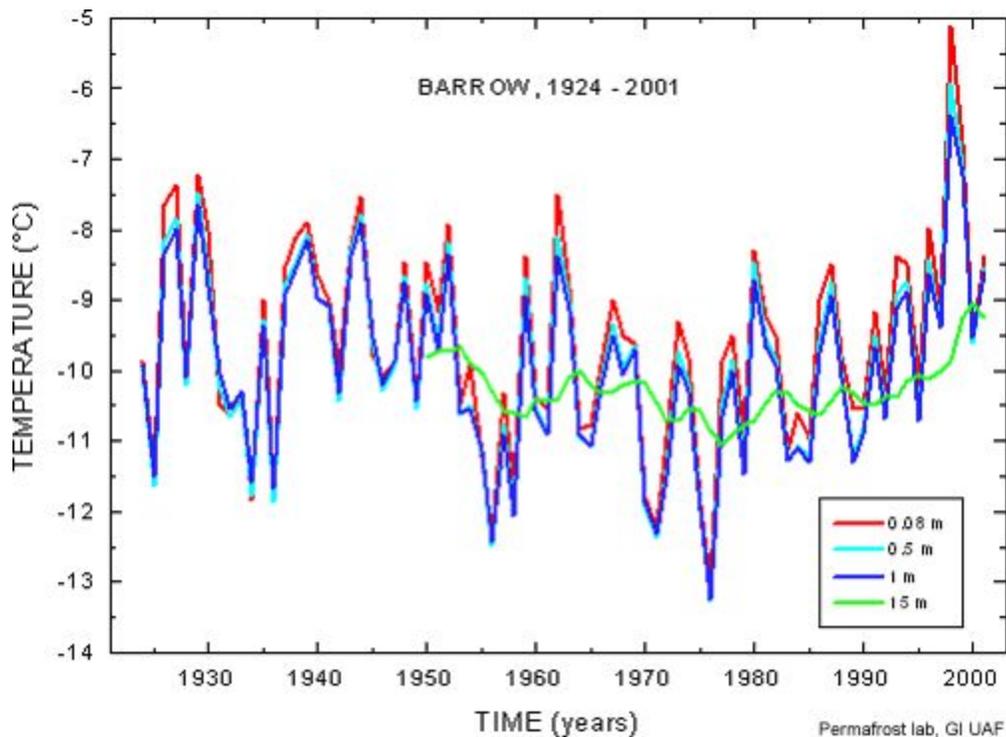


Image 11: Calculated mean annual temperatures in the active layer (at the depth of 8 centimeters) and near-surface permafrost (between 0.5 and 15 meters) using a model calibrated for the Barrow site and the data from the Barrow meteorological station<sup>10</sup>.

<sup>10</sup> <http://permafrost.gi.alaska.edu/project/permafrost-observatory-barrow>

## 2.2.4 Geographical Considerations

The most important geographical and climate consideration in Barrow and the North Slope is the receding sea-ice. An enormous wealth of local traditional knowledge exists describing the changes over the past two decades, as it is monitored and witnessed first hand during subsistence activities. The National Snow and Ice Data Center provides updated data<sup>11</sup> on the sea ice extent as measured through satellite images.

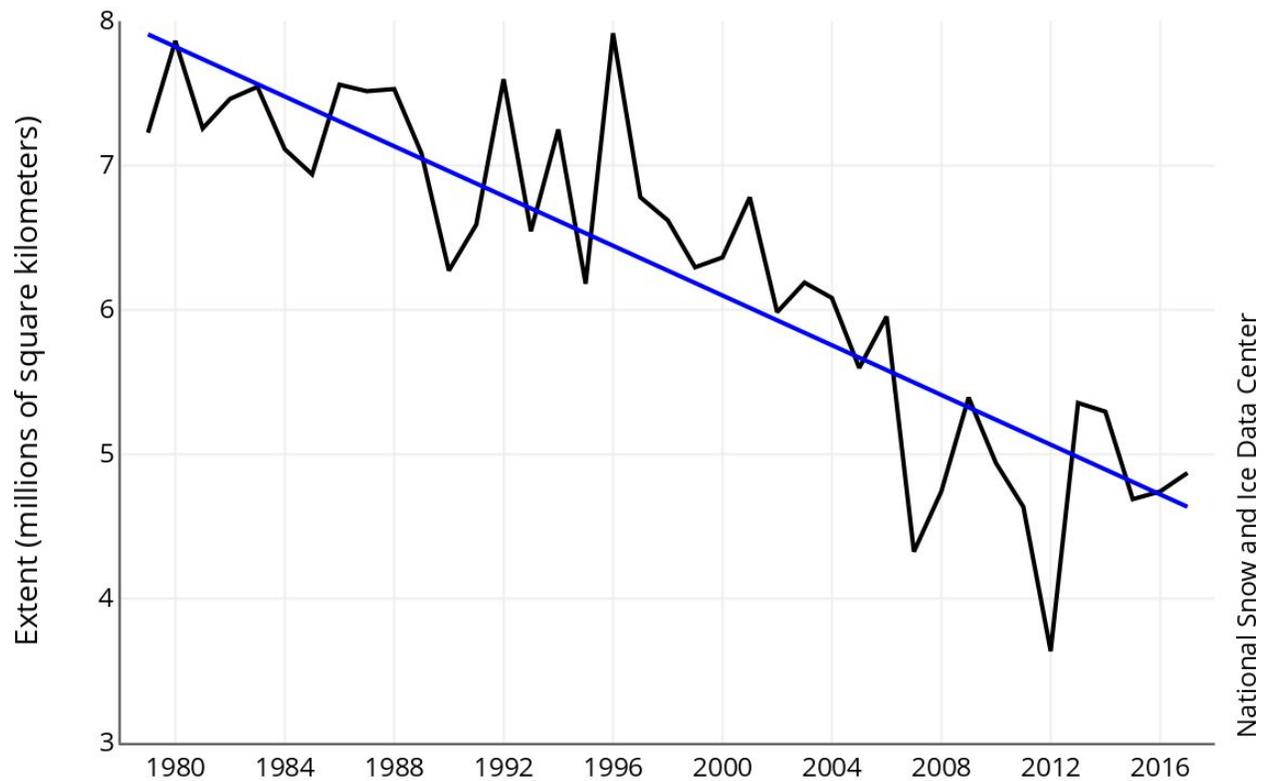


Image 12: Average Monthly Arctic Sea Ice Extent (September 1979 - 2017).

The sea-ice variations will undoubtedly change life in the North Slope. The biggest change will come from the opening of the Northwest Passage to commercial and passenger transportation and logistics. Looking ahead, the need for a wide number of services and resources, eg:

- Arctic Marine Services,
- Coast Guard,
- Arctic Search and Rescue,
- Deep Sea Ports,
- Marine Logistics Landing and Staging

<sup>11</sup> <http://nsidc.org/arcticseaicenews/2017/10/arctic-sea-ice-2017-tapping-the-brakes-in-september/>

## 2.2.5 Wildlife



Image 13: *Typical and unique wildlife found in the North Slope, Polar Bears, Arctic Fox, Bowhead Whales and King Eider ducks.*

Lying north of the tree line the dominant vegetation types are grass, moss and sedge. Polar bears, arctic foxes, and lemmings are native to the region along with many other types of mammals. Endangered species such as the Polar Bear, Steller Eider and Spectacled Eiders, also call the North Slope home with migrations during the warmer months.

During the spring, bowhead whales migrate close to shore, and both gray and beluga whales are often sighted during the summer. Whale, seal, polar bear, walrus, waterfowl, caribou, and fish are harvested from the coast or nearby rivers and lakes.

**Polar Bear Management:** A treaty between Inupiat Natives, U.S. and Russian officials was signed in 2000 due to the need for coordinated management of the shared Alaska-Chukotka polar bear population that inhabits the Chukchi and northern Bering seas<sup>12</sup>.

**Whaling Management:** The Inupiat and Siberian Yupik Eskimos living in the coastal villages in northern and western Alaska have been hunting the bowhead whale for thousands of years. As the International Whaling Commission<sup>13</sup> (IWC) coordinates quotas, information and safety notices.

<sup>12</sup> <https://www.fws.gov/alaska/fisheries/mmm/polarbear/bilateral.htm>

<sup>13</sup> <http://www.aewc-alaska.com/home.html>

## 2.2.6 Caribou / Reindeer Herds of the Arctic



Image 14: *Caribou, like all wildlife species, need to be managed at the population level.*

Oral history interviews have been conducted with most of the former reindeer herders living in Barrow, providing rich set of stories about the role of reindeer herding in Barrow's history.

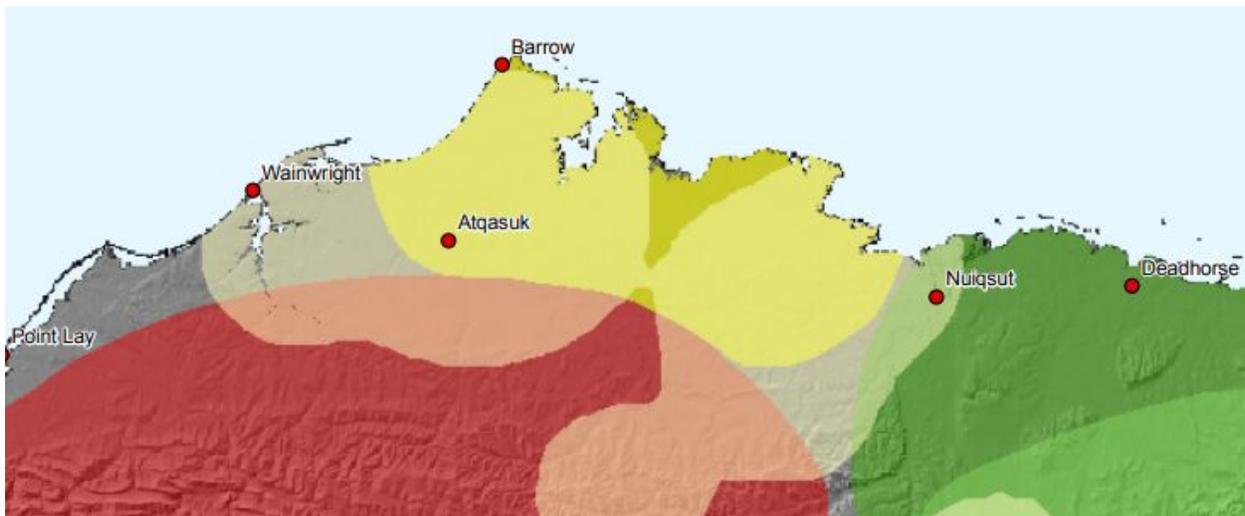


Image 15: *The three main herds of the North Slope<sup>14</sup>: Yellow: Teshekpuk (64,000 animals), Red: Western Arctic (235,000 animals) and Green: Central Arctic (22,000 animals).*

The University of Alaska Fairbanks, Reindeer Research Program<sup>15</sup> develops and promotes the reindeer industry throughout Alaska and works closely with producers to develop and conduct research projects that can be applied directly to their operations. Outreach is a significant part of our program and we have strong ties to communities and schools across Alaska.

<sup>14</sup> <http://www.north-slope.org/assets/images/uploads/b11.pdf>

<sup>15</sup> <http://reindeer.salrm.uaf.edu/>

## 2.2.7 Cultural Resources and Historic Preservation



Image 16: *Artifacts from Walakpa, left to right: (1) Cellar entrance, (2) Mummified Seal (found in cellar), (3) Ornate Toggle Spearhead and (4) Toy Umiaq (Skin Boat) are a few of the thousands of artifacts uncovered at Walakpa and Point Barrow, now threatened by coastal erosion.*

People have lived for thousands of years in the North American Arctic. The archaeological sites they left behind are spectacular, with artifacts in nearly as good shape as the day their owner last set them down. The cold of the region has kept sites in pristine shape for hundreds, in some cases thousands, of years.

These sites are important heritage repositories for indigenous people who have cultural ties to them. They are important for our understanding the human past, not just in the Arctic, but worldwide. Early New World inhabitants passed through the Alaskan Arctic to reach the rest of North America. There have been two separate migrations of hunting peoples across the cold North American Arctic, which by cross cultural analogy can help us understand how human hunters first migrated out of Africa, and how they adapted to the much colder regions that they reached in Europe and Asia. Sites with a number of occupations layered above each other (like Walakpa) are the most informative. By allowing us to compare the different periods they eliminate the worry that some differences over time are due to groups being in different locations, since all of the sites (one on top of another) are in the same place.

Traditional archaeological studies of structures and artifacts are now amplified by new techniques, more of which come online almost annually. Today the refuse (midden) preserved at these sites can be used to study everything from ancient DNA (aDNA), to stock structures of important Arctic animals, to changes in locations where different species fed, to long-term stresses on individual and to associated environmental conditions.

Walakpa's archaeological expeditions are coordinated through UIC Science at the BARC.

## 2.3 INFRASTRUCTURE ASSETS

### 2.3.1 Energy, Water and Sanitation Utilities



The Barrow Utilidor System (BUS) is a unique 3.2 mile wood tunnel, which runs below Barrow like an underground road system and allows the Coop to transport running water through the permafrost to homes, schools and businesses. The Utilidor went into operation in 1984.

Located 100 feet from the coast, replacing the Utilidor if it fails due to storm damage or coastal erosion has been estimated at \$800M to 1 Billion dollars.

Barrow Utilities & Electric Coop Inc. (BUECI) is a not-for-profit organization member-owned cooperative which provides electricity, natural gas, water, and sewer services. BUECI has an average of 55 full-time permanent employees.

The Utilidor is constructed of a trapezoidal wood structure, which is 6 feet high, 6 feet wide at the base and tapers to 5 feet wide at the top. The individual sections are spliced together to form the straight portions of the Utilidor. At each intersection a metal frame with a wooden skin is installed. The wood sections and metal frame boxes are bolted together to form one continuous system. Power, Lighting, Ventilation and Instrumentation (Telemetry) are provided throughout the system for safety, operation and maintenance. Air temperatures are monitored as well. The cold arctic air must be heated to roughly 48 degrees Fahrenheit before it can be pumped into the Utilidor and replaced six (6) times per hour.

The following services are provided or networked within the Utilidor system: Potable water, Sewage collection, Telephone service lines, TV Cable service lines, Fiber optic service (NSB communication network), Electric service lines.

The Utilidor supplies water to fire hydrants throughout the town. Hydrants are “dry barrel”, meaning, no water is actually in them until an internal stem is driven down to open them up. The water in this system is constantly circulating.

### 2.3.2 Solid Waste Disposal and Landfills

The NSB provides planning, administration, and funding for solid waste management in Barrow.

The NSB operates a thermal oxidation system (TOS) incinerator facility for municipal waste in Barrow. The facility is located near the old Barrow Landfill on the Middle Salt Lagoon on Stevenson Street. Currently, the TOS facility is not operational and has not been operating steadily for over a year. During the time that it has not been operational, the waste is directly landfilled in the Barrow landfill without incineration. The TOS facility incinerators do not produce electricity, but emit directly to a stack exit. It was designed to process 30 tons per day of municipal waste and is currently permitted to process up to 20 tons per day of domestic and commercial waste (State of Alaska Department of Transportation & Public Facilities 2014).

There were plans to repair the controls in the TOS facility this year to return it to service by late 2014 which were not completed. Once the repairs are complete however, the NSB will begin incinerating its refuse before depositing directly in the landfill. Incinerating the waste before landfilling with a 30% reduction in the overall waste footprint.

The NSB Barrow landfill is an ADEC permitted Class II Municipal Solid Waste (MSW) Landfill. The landfill is permitted to accept municipal solid waste, non-radioactive materials, inert wastes, construction and demolition debris, ash, and sludge. The NSB provides refuse service to commercial businesses and households. Trash bins located throughout the community are picked up by refuse trucks and dumped.

The current landfill site was placed on land purchased from UIC in 2003. It is located about four miles southeast of Barrow and is accessed from Eastfield Road. The new Barrow landfill was opened in 2008 and permitted in 2009. This landfill will ultimately have eleven cells when completely constructed. Currently, the first cell is full of debris and the second cell is opening and already receiving waste.

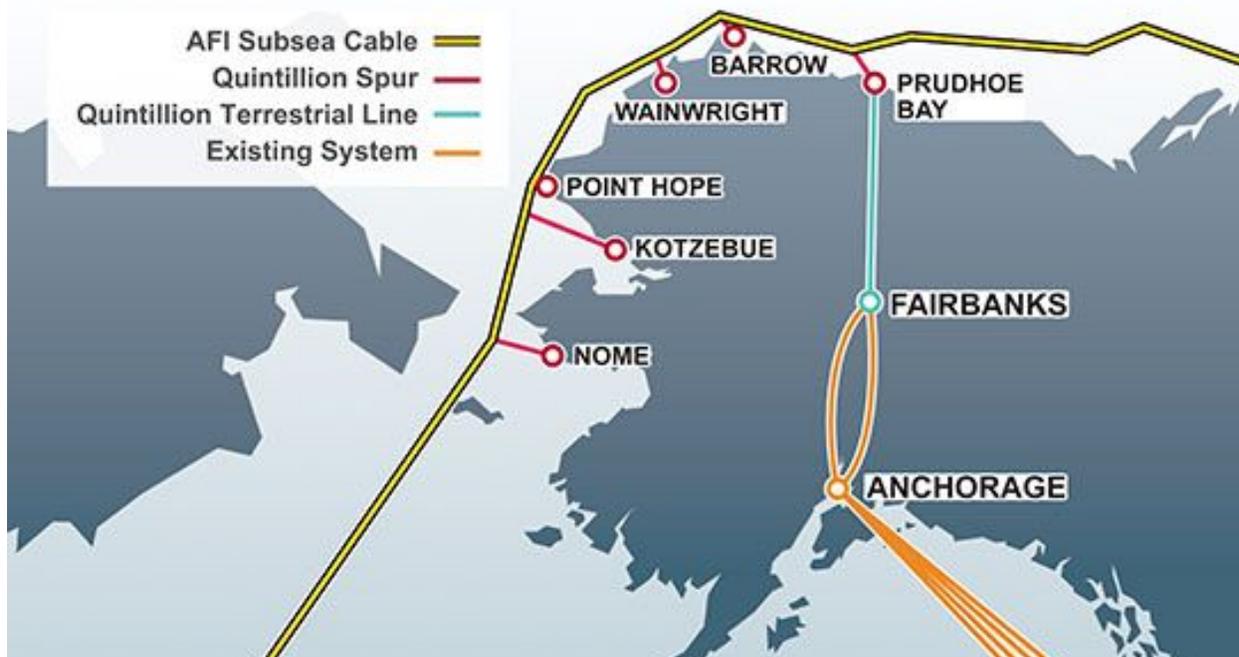
The containment cells have an average storage volume capacity of about 81,000 CY per cell for waste and cover material. The maximum storage capacity of the first cell was about 95,000 CY. The first cell filled more quickly than originally estimated. In part, this happened because the early estimates assumed that 60% of the waste stream destined for the landfill was combustible, thus reducing the waste weights by 85% (North Slope Borough 2009)

The Alaska Energy Authority produced a document on "Burning Garbage and Land Disposal In Rural Alaska", with a number of useful pointers and methods for residential and municipal solid waste disposal<sup>16</sup>.

---

<sup>16</sup> [http://itepsrv1.itep.nau.edu/itep\\_course\\_downloads/AQ-Alaska\\_Resources/Burning/BurnDisRurAK.PDF](http://itepsrv1.itep.nau.edu/itep_course_downloads/AQ-Alaska_Resources/Burning/BurnDisRurAK.PDF)

### 2.3.3 Telecommunications / Broadband



Locally owned and operated Arctic Slope Telephone Association Cooperative (ASTAC) provides telecommunications services to Anaktuvuk Pass, Atkasuk, Barrow, Deadhorse-Prudhoe Bay, Kaktovik, Nuiqsut, Point Hope, Point Lay and Wainwright. The cooperative serves about 5,600 access lines. ASTAC offers Internet and cell phone services as well.

Also available in Barrow, is Alaska founded GCI, whom introduced long-distance competition in 1979. GCI is the state's largest provider of Internet services with dial-up, cable modem, wireless, digital subscriber line (DSL) and dedicated access. Its cable television services pass 90 percent of the state's households with 65 percent penetration. Digital cable and cable modem service is available to 90 percent of its subscribers.

Barrow has 2 registered cell phone towers and now (although at times intermittent) receives signals from most cell phone services. Local radio station KBRW 680 AM, 91.9 FM airs public radio that covers native affairs, popular music, local and religious programming.

Residents still heavily rely on CB-radio communication to plan their subsistence activities and to make public announcements. There is also an emergency CB protocol in place for disaster situations.

The most exciting recent telecommunications development in Barrow however, is the completion of the first leg of the Quintillion Subsea Fiber optic line. The arduous work of installing the cable were finally overcome and service is said to be available in Barrow now by

ASTAC since December 2017. This development opens ecommerce and scientific opportunities for Barrow.

### 2.3.4 Transportation



Barrow experiences physical isolation due to the fact that there are no roads coming into the village except for the seasonal ice roads. Inside of Barrow the transportation options consist of a public bus system, taxis, and airlines which include Alaska Airlines (Commercial passenger and cargo) and ERA Aviation (Charter and Helicopter).

UIC Bowhead Transport is the only way for heavy equipment and construction materials to be delivered to Barrow. The cost of shipping materials by transporting them to Prudhoe Bay through the Dalton Highway and barging them to Barrow is equivalent to shipping directly from Seattle. Bowhead accepts orders between May and June for deliveries to Barrow and a few of the other North Slope Borough Villages. The barge leaves Seattle around the beginning of July of each year to make it yearly run to Barrow, Point Hope, Point Lay, Wainwright, and Kaktovik.

A recent (2015) inventory of vehicles showed that there are 4,242 total vehicles in Barrow, with 43% commercial trucks, 25% passenger vehicles, 17% pick-ups and 8% were snow machines.

There are also 43 buses used for public transport. The NVB recently completed its 2018-2023 Long Range Transportation Plan<sup>17</sup>, which aligns closely with the goals of this CEDS.

### 2.3.5 Emergency Services

Emergency services include police, fire, search and rescue and risk management. These services are provided by the NSB.

- The NSB Police Department's headquarters are in Barrow, as are the jail and 24-hour dispatch center.
- The NSB Fire Department, also headquartered in Barrow, responds to fires and other emergencies. Staff includes medical professionals for critical care air ambulance and medevac services, instruction at Iḷisaḡvik College and fire prevention and safety programs for school children. There is one fire station in Barrow, another in Browerville and a third proposed to be located at the Cakeeater Road and the Laura Madison extension intersection.
- NSB Search and Rescue provides medevac, search and rescue and other emergency services with four dedicated aircraft, including a new helicopter delivered in December 2015. There is also a volunteer search and rescue organization in Barrow.
- NSB Risk Management Division provides disaster coordination and emergency preparedness and response. Risk Management stores supplies and equipment for immediate deployment in the case of an emergency.

### 2.3.6 Recreational Facilities

The City of Barrow manages the greatest share of recreational needs in Barrow, including:

- **Piuraaḡvik Recreation Center** (1984, renovated 2010). A \$13M expansion effort is planned for a 700 people fold down stage and movie screen and five interchangeable program spaces for aerobics, weight training, exercise equipment and dance lessons.
- **Roller Rink**, located in the former BIA "Home of the Whalers" Gym, offers roller skating, soccer, "open-mic" nights and special events such as Piuraaḡiaqta (Spring Festival).
- **The Cathy Parker Football Field** (2007) was named after a Florida woman who raised \$500,000 to ship 60 tons of blue artificial turf to Barrow to build the Whalers football field.
- **Playgrounds.** There are four outdoor playgrounds, two in Browerville and two in Barrow, used primary during the summer months. There is one indoor playground at Ipalook Elementary School, but it is not available for public use. An indoor playground available for public use would be a welcome addition to the community.
- **Aquatics:** The indoor pool at Barrow High School is available for public use during non-school hours. During the summer months, the BHS pool is open for community use and is operated as part of the City of Barrow Recreation Department programs.

---

<sup>17</sup> NVB Long Range Transportation Plan 2018-2023 [[ref](#)].

A representative of the Qikiqtagruk Inupiaq Youth Council offered feedback to our CEDS, to quote: **"In the village, Ball is Life"**, drawing attention youths' and teenager's day to day physical and emotional needs.

## 2.4 INDUSTRY CLUSTERS

26% percent of the workforce is employed by the North Slope Borough and a total of 43% is employed by the government, including the NSB, NSBSD, City of Barrow, State of Alaska and federal agencies.

The regional corporation and native village corporation and their subsidiaries are major employers as well: Arctic Slope Regional Corporation (ASRC) and Ukpeaġvik Iñupiat Corporation (UIC), are both Alaska Native corporations headquartered in Barrow and employ over 10% of the workforce in Barrow.

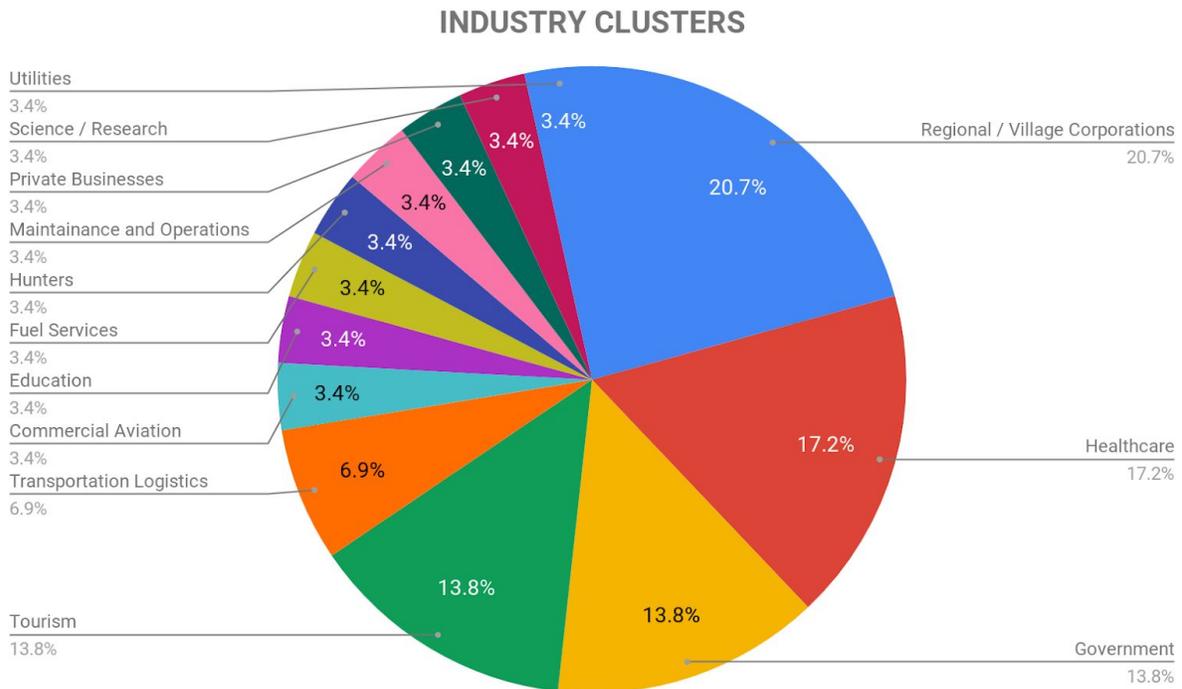


Image 17: Industry Cluster survey results conducted during SWOT meetings.

Our SWOT meetings included discussions industry clusters in Barrow, which reflect a high confidence in regional corporations, government and healthcare for employment.

The most interesting results from this analysis is that while **Tourism** is generally perceived as a significant industry cluster, the tourism industry is generally unstructured aside from the hospitality industry, namely hotels, restaurants and and janitorial services.



## 2.5 ECONOMIC RELATIONSHIPS

**Federal:** The federal government has many agencies working with Barrow directly, indirectly, and through grants; these include but are not limited to the Department of Interior (DOI), Bureau of Indian Affairs (BIA), Bureau of Land Management (BLM), Fish and Wildlife Service (FWS), Department of Justice (DOJ), Housing and Urban Development (HUD), Department of Commerce (DOC) and Economic Development Administration (EDA)

**The State of Alaska:** Also involved directly, indirectly, and through grants, including the State of Alaska Court System, State of Alaska Troopers, and Health and Welfare programs.

**The North Slope Borough:** Incorporated as a first class Borough on July 2, 1972 under the laws of the State of Alaska. A Home Rule Charter<sup>18</sup> was adopted in 1974. The NSB is responsible for the regional governance of the seven villages in the north slope. At 89,000 square miles of landmass, it is the largest county-level political subdivision in the United States.

**The City of Utqiagvik** was incorporated as a 1st Class City in 1958, and changed its name from Barrow in December 2016. The City is responsible for harbors and docks, recreation, licensing and cemeteries. Their recreational facilities include Piuraagvik Recreation Center, and the Barrow Hockey and Curling Association Ice Skating Rink.

**The Iñupiat Community of the Arctic Slope (ICAS)** is the Federally Recognized Regional Tribe governed by the Indian Reorganization Act of 1934, as amended, that represents and is selected by the Iñupiat people of the Arctic Slope region. ICAS was established as an IRA in August 26, 1971. The mission of ICAS is to exercise its sovereign rights and powers for the benefit of tribal members, to conserve and retain tribal lands and resources including subsistence and environmental issues, to establish and carry-out justice systems including social services pursuant to Iñupiat Tribal law and custom, and to increase the variety and quality of services provided to current tribal members and for our future generations.

**The Native Village of Barrow (NVB)**, is the longest standing local government in Barrow, is a federally recognized tribe incorporated in 1940 under the Indian Reorganization Act of 1934 (48 Stat. 984) as amended for Alaska Natives in 1936 by the United States Congress. The Native Village of Barrow represents over 3,500 members and meets a variety of tribal member needs including adult basic, secondary, and higher education; realty; wildlife; housing; Indian reservation roads; social services and child protection; tribal court, environment protection; and economic development. This is accomplished through its Self-Governance Funding Agreement with the US Department of Interior Bureau of Indian Affairs, various grants, and pull-tab gaming. The NVB is pursuing for-profit business development in support of tribe member owned businesses, workforce development and business growth in Barrow and the region as a whole.

---

<sup>18</sup> A home rule charter is, in essence, a local constitution ([Ref](#))

## 2.6 FACTORS AFFECTING ECONOMIC PERFORMANCE

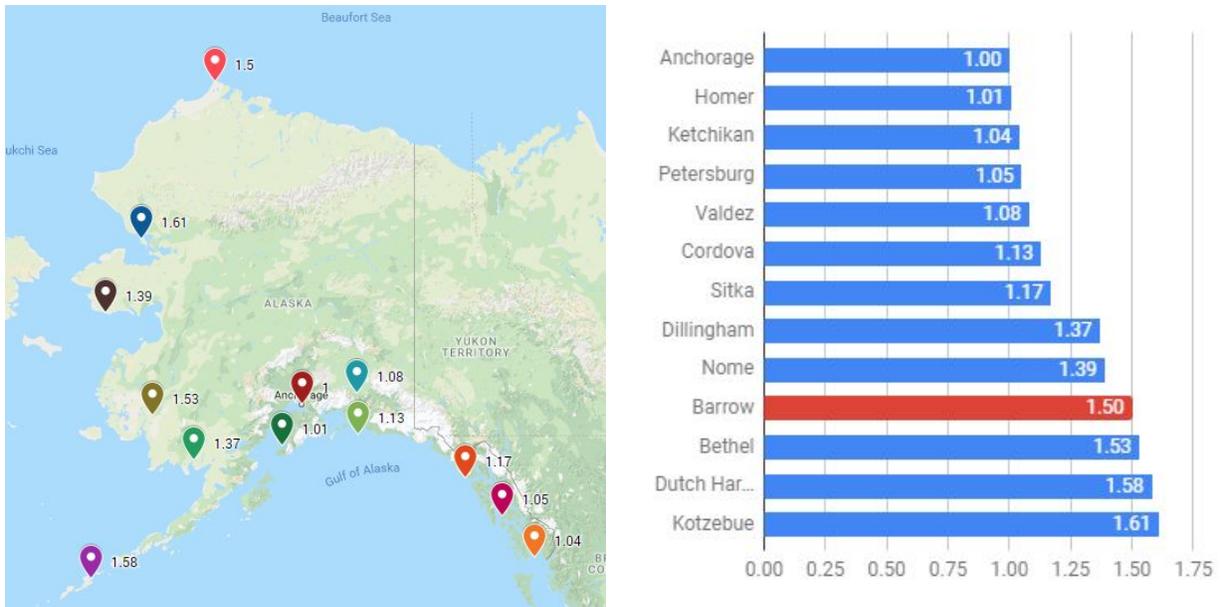


Image 18: *Alaska Community Cost Differentials (2008) which compares the total cost of living, utilities, housing, fuel and transportation, etc against Anchorage.*

The remote location, lack of connectivity to the road system and dependence on the volatility of oil and gas exploration in the region, the cost of living is one of the highest in the nation. As a result of these prices and limited product selection, caused in part by high shipping costs, residents are forced to shop outside of Barrow, often taking several plastic totes as luggage to purchase items in Anchorage and Fairbanks when they fly out. This causes the money to bleed away from the community instead of sustaining it.

Table 1: *Living in Barrow is 50% higher than living in the lowest priced index of Anchorage.*

Example of goods	Barrow	Seattle	%Diff
Milk – 1 gallon plastic container	\$9.99	\$2.49	401.20%
Cereal (Special K frosted flakes) box	\$8.65	\$4.99	173.35%
Toilet Paper (Charmin 12 roll)	\$13.69	\$6.99	195.85%
Drywall per sheet	\$43.00	\$10.82	397.41%

The midnight sun has attracted tourism in which the local artisans sell their arts and crafts to provide seasonal cash income. Seven residents hold commercial fishing permits. Many residents rely upon subsistence food sources: whale, seal, polar bear, walrus, duck, caribou, along with grayling and whitefish that are harvested from the coast or nearby rivers and lakes.

## 2.7 OTHER FACTORS

### 2.7.1 Housing



*Image 19: All construction is on posts to protect permafrost from residential heating. Drift snow and high winds take a toll on paint and siding.*

There are two major providers of housing in Barrow, Tagiugmiullu Nunamiullu Housing Authority (TNHA) and the Native Village of Barrow's Housing Department (NVBHD).

The community of Barrow is experiencing a shortage of housing of all types. The 2008-2012 American Community Survey 5-year Estimates indicate that 13% of households in Barrow are overcrowded, 4% of which are severely overcrowded (US Census 2012).

In 1992, UIC conveyed a number of home site lots to shareholders who did not have family homes in village, to private ownership. These lots will become accessible through this East Barrow Shareholder Lot roads construction project, to allow housing units to be built. A project is underway to provide opportunity for approximately 255 new homes to be constructed alongside the new hospital, alleviating the housing crisis. The North Slope Borough 2015 Comprehensive Plan, calls for immediate action to address this crisis.

To meet future demand, Barrow will need approximately 37 additional housing units per additional 100 people. Beyond the immediate need for 267 housing units, the population increase to 5,495 in 2020 will require an additional 191 units. If demand is continually met, the Barrow community will still need an additional 211 units above the 191 needed in 2020 and the 267 needed immediately to accommodate a projected population of 6,070 in 2030. In 2035, an estimated 515 units will be needed beyond Barrow's current housing stock.

## 2.7.2 Health, Safety and Social Services



Image 20: *Samuel Simmonds Memorial (built 2013), has 10 inpatient and 2 delivery rooms.*

There are two major health suppliers in Barrow: Samuel Simmonds Memorial Hospital (under the Arctic Slope Native Association) and the North Slope Borough Health Department. Arctic Slope Native Association, Native Village of Barrow, North Slope Borough Health Department, and the State of Alaska all provide social services.

The North Slope Borough Public Health provides the following: Behavioral Health; Wellness Clinic; Public Health Nursing; Community Health Aide Program; Senior Program; Eye Clinic; Women, Infant, and Children's Program; Allied Health Program; Arctic Women in Crisis Shelter; Children Youth Services; and the Vet Clinic.

The Native Village of Barrow provides the following to the membership in Barrow: Tribal Child Protection, Foster Care, and Caregivers Program for Elders. The most critical need in the village is the development and provision of Childcare services, a Juvenile Detention Facility and Alcohol and Drug abuse centers.



Image 21: *Nalukataq is the spring whaling festival of the Iñupiat Eskimos of Northern Alaska. An opportunity to give thanks and to distribute whale meat to the community.*

## **2.8 NATURAL RESOURCES**

### **2.8.1 Barrow Gas Fields**

The U.S. Navy conducted exploration within the NPR-A (1944-1952), which led to the discovery of natural gas south of Barrow. Since then a number of gas fields have been identified including The South Barrow Gasfield (1949), East Barrow Gasfield (1975) and Walakpa (1976). In 1984, the federal government, under the Barrow Gas Fields Transfer Act, conveyed entitlement of 19 existing wells and subsurface resources to the North Slope Borough for community use<sup>19</sup>.

During the first half of 2011, the South Barrow Gasfield produced 1,115,000 cubic feet of gas per day (Coffman 2014). In 2013, gas production began dwindling; additional well drilling in Walakpa made up for much of the declining productivity of South Barrow. The Walakpa Gasfield is located southwest of Barrow. A drill program for the Barrow community began in the early 1990s, resulting in the construction of eight wells, infield pipelines, a gathering facility, a field generation facility and 16 mile aboveground transmission lines connecting the gasfield to BUECI.

During the winter of 2011, five horizontal wells were drilled: Savik 1 and Savik 2 at East Barrow and Walakpa wells 11, 12, and 13 in Walakpa (Petroleum News 2013). Figure 17 depicts gas pipelines in Barrow and Browerville and location of gas wells. Production at the East Field continues today through an upgraded six inch aboveground transmission pipeline to the gas handling facility at South Field. The 2011 program upgraded the six inch pipeline from East Field and established new well houses on all the wells drilled under this program. The wells in both East Barrow and Walakpa are connected with six-inch diameter pipe terminating at the gas handling processing facility located at the South Barrow Gasfield.

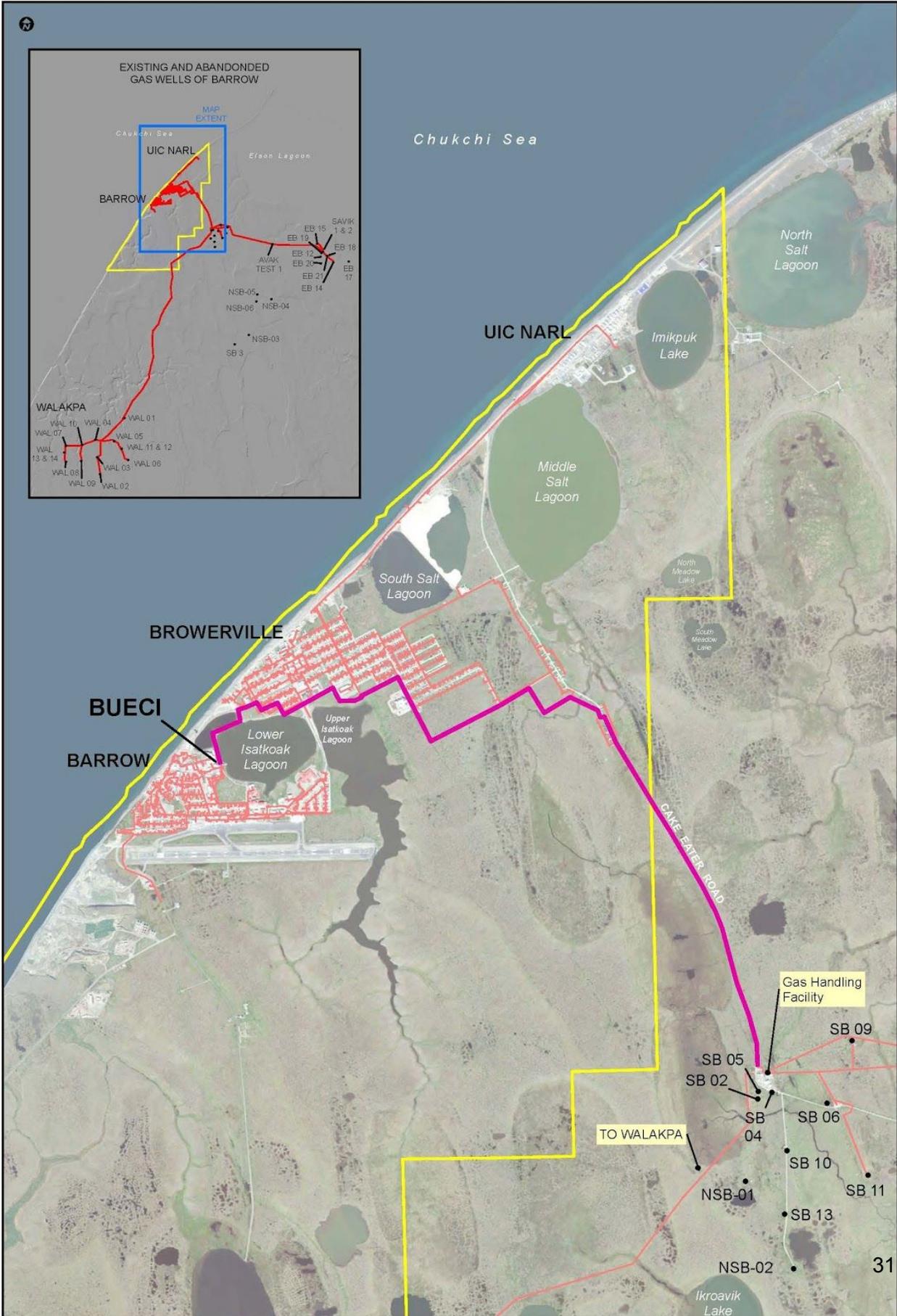
Natural gas fuels approximately 93% of all households in Barrow. The nearby Barrow Gas Fields make heating homes in Barrow one of the least expensive areas in the state.

Barrow is the staging ground for Chukchi and Western Beaufort Sea offshore oil and gas development. Thirty percent of the world's undiscovered natural gas and natural gas liquids are estimated to occur in the Outer Continental Shelf and Circum-arctic region. Increased offshore exploration can be expected to increase with receding sea ice. Since 2005, there has been over \$3.5B dollars of commercial investments in Chukchi and Beaufort Sea offshore.

UIC operates a CNG vehicle fuel station in Barrow for \$2.75/gal.eq. For comparison, the ASRC operated fuel station provides \$5.90/gal gasoline and \$6.40/gal diesel, taken on Oct 3rd, 2018.

---

<sup>19</sup> [http://www.north-slope.org/assets/images/uploads/Barrow\\_Comp\\_Plan\\_March\\_2015\\_FINAL.pdf](http://www.north-slope.org/assets/images/uploads/Barrow_Comp_Plan_March_2015_FINAL.pdf)



## 2.8.2 Gravel

In the Barrow area, gravel material for construction is limited. There are two active commercial material source mining pits used to supply the gravel needs for non-airport construction and maintenance needs<sup>20</sup>:

- **SKW** operates a pit on land owned by the City of Barrow and located at the southwest end of the airport. This pit is reaching the end of its useful life. Although it is still mined, it will not be able to be the sole provider for large gravel needs. Expansion is possible and estimated yield has been discussed as high as one million cubic yards (CY). The soils are classified as gravel, producing sandy gravel and gravelly sand.
- **UIC** operates a pit four miles southeast of Barrow located off of Eastfield Road near the landfill. The soils here are generally sandier/siltier than the material in the SKW pit and are poorly graded sand with silt and gravel.
- **DOT** During the construction of the airport, the material was mined from the Alaska Department of Transportation (ADOT) pit located between the runway and the SKW material pit on state land. Expansion of this pit is limited as minimal materials remain within the State property. Also, there is a petroleum pipeline that is located along the south boundary of the pit. Emaiksoun Road limits expansion from the east.

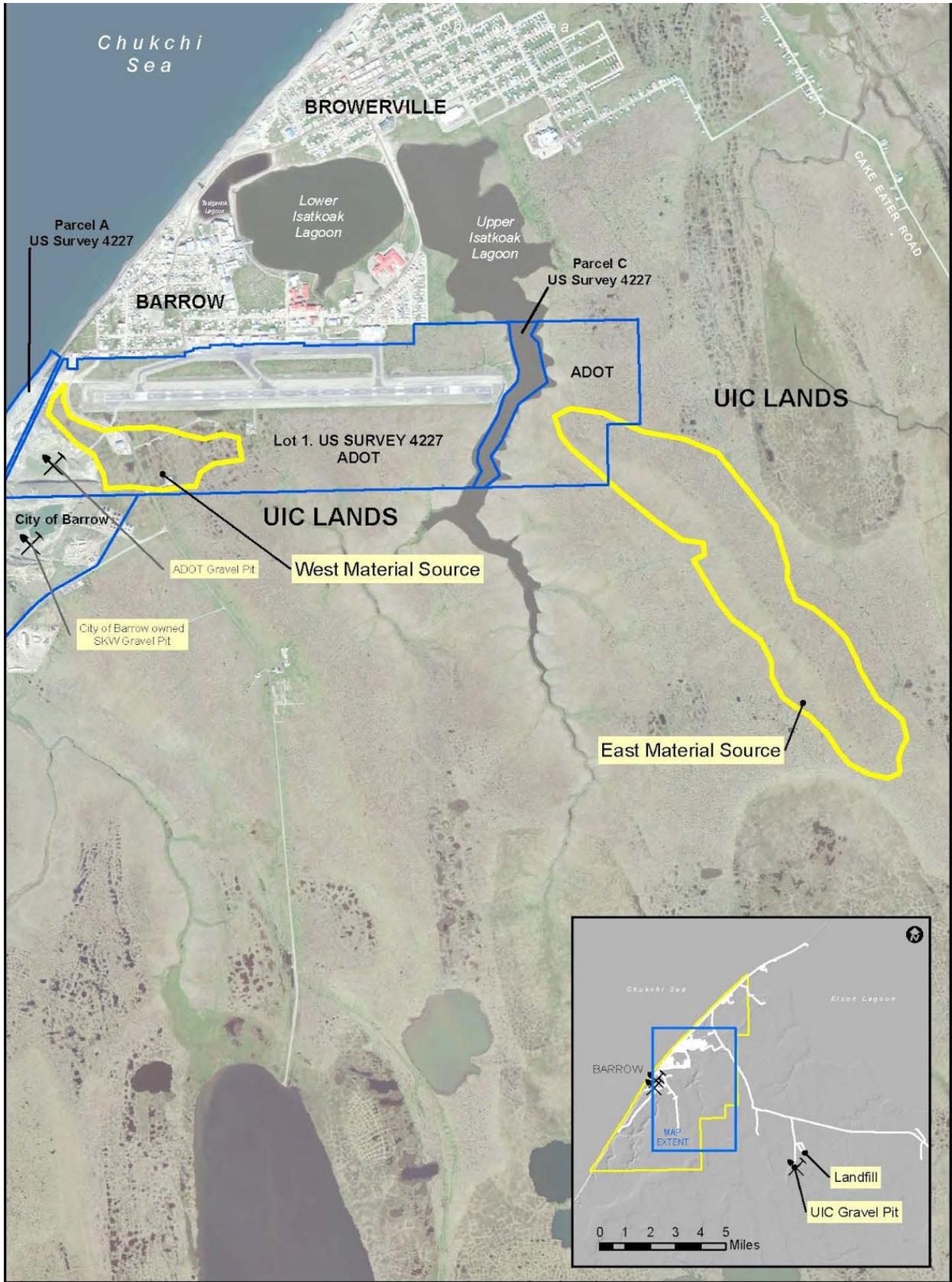
Gravel needs for community use includes landfill cover, road and culvert maintenance and infrastructure parking area maintenance as well as for private use and capital projects. Large scale development, such as the new Samuel Simmonds Memorial Hospital or new Top of the World Hotel create additional demands for gravel.

As part of the Barrow Airport Master Plan, ninety-five borings were drilled in and adjacent to the two material sites to depths of 20 to 50 feet. **The West Material Source** is located on state land adjacent to their existing material pit. Another source, **East Material Source**, is south and east of the runway. A portion of the northern area that was explored is located on state land, but the majority of the exploration area was conducted on land with surface rights owned by UIC with BLM subsurface rights. General conditions found seem favorable to a sizeable material source that could produce gravelly sands and sandy gravels.

Barrow is a growing community and will require gravel to support the future development. The construction and maintenance needs will drive the need for well-graded construction material, while providing a material that is cost efficient. One to two years is needed to obtain a permit for a new material source, depending on environmental issues. The easiest and quickest sources of additional material are expansions of the UIC and SKW/City of Barrow pits. However, these pit expansions may produce limited material that is of lesser quality. A program for expansion of existing pits should be considered where practical and feasible, along with a careful evaluation of new material sources that could economically be developed to serve the community.

---

<sup>20</sup> [http://www.north-slope.org/assets/images/uploads/Barrow\\_Comp\\_Plan\\_March\\_2015\\_FINAL.pdf](http://www.north-slope.org/assets/images/uploads/Barrow_Comp_Plan_March_2015_FINAL.pdf)



### 3. SWOT ANALYSIS

A Strengths, Weaknesses, Opportunities and Threats (SWOT) analysis is an activity which guides participants into creating lists and mind maps for discovering, generally speaking, what works and what requires our attention in any given endeavor, to assist with decision making:



Image 22: A SWOT draws a distinction between internal/external and helpful/harmful factors and how direct a comprehensive strategy. In general we want to a) Focus on strengths. b) Shore-up weaknesses. c) Capitalize on opportunities, d) Recognize threats.

Stakeholder business offices are located in Anchorage and Barrow, so we conducted SWOT meetings at each main HQ: NVB, Iḷisaḡvik, ASRC, UIC which were open to all participants. We used this opportunity to also collect information on:

- **Industry Clusters:** Clusters are usually identified from demographic and census data, but asking our participants allowed us to gauge what the "perceived" clusters are. We can interpret this as industries which workers have the most confidence in contributing to the local economy.
- **Resilience:** Economic and environmental factors which affect economic stability, such as large companies shutting down, storm and flood hazards, etc
- **Big Ideas:** A place for blue sky thinking, where everyone can let their imagination run wild. Maglev trains throughout the north slope, rocket launch facilities, 100 acre hydroponic farms to feed the entire North Slope, anything goes.



Image 23: "SWOT PLUS" room setup at the NVB. The layout of the room allows participants to explore ideas and options on their own, while contributing, discussing and iterating ideas. The large map at the center of the room allows for planning and strategizing. A stack of cards with questions were available which helped uncover new ideas, eg. "What is missing from Barrow?"



Image 24: SWOT meeting at Iñisaġvik College. The focus of this meeting was on education and workforce development, however deep conversation on industry clusters, family values, professional housing (for professors and hospital staff) and the hospitality/tourism industry emerged. The difficulty of retaining expertise was something deeply felt by the college.



Image 25: *The Emergency Manager from the NSB Risk Management Department discusses risk mitigation procedures from weather and hazardous materials with Iñisaġvik staff.*

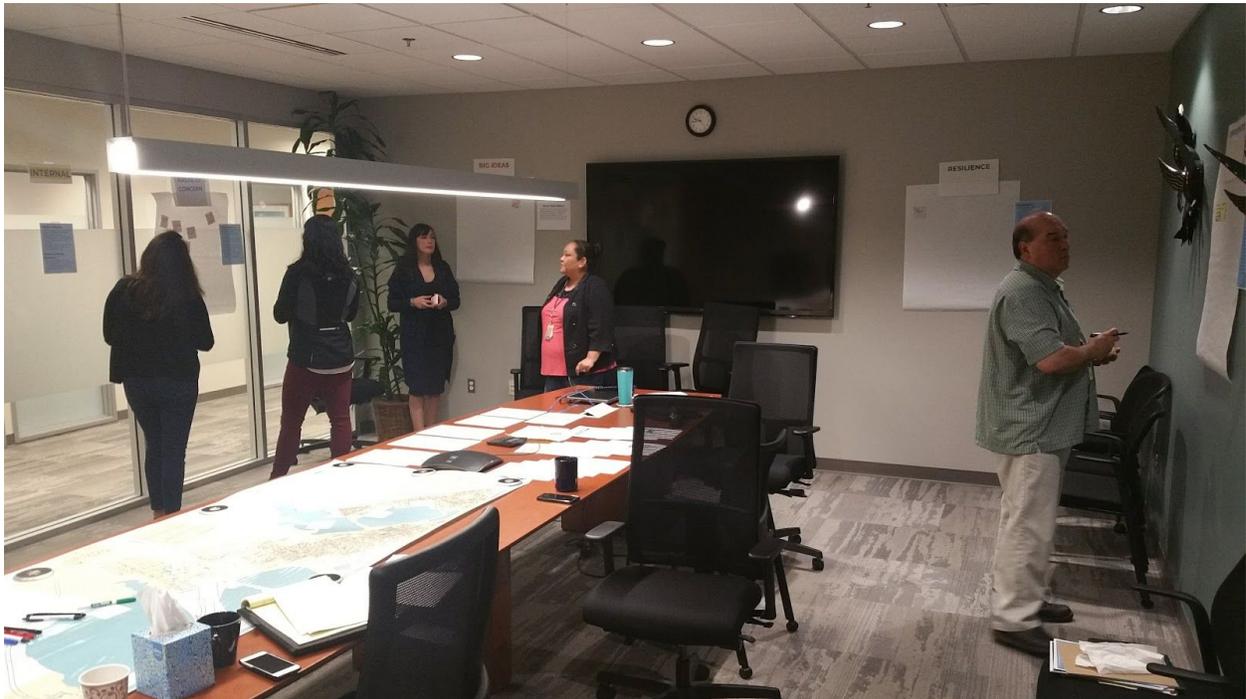


Image 26: SWOT meeting at ASRC building attended by the public and staff from ASRC Community Development department and Alaska Growth Capital AGC, an ASRC subsidiary which provides startup and expansion investment capital to North Slope entrepreneurs.

### 3.1 STRENGTHS

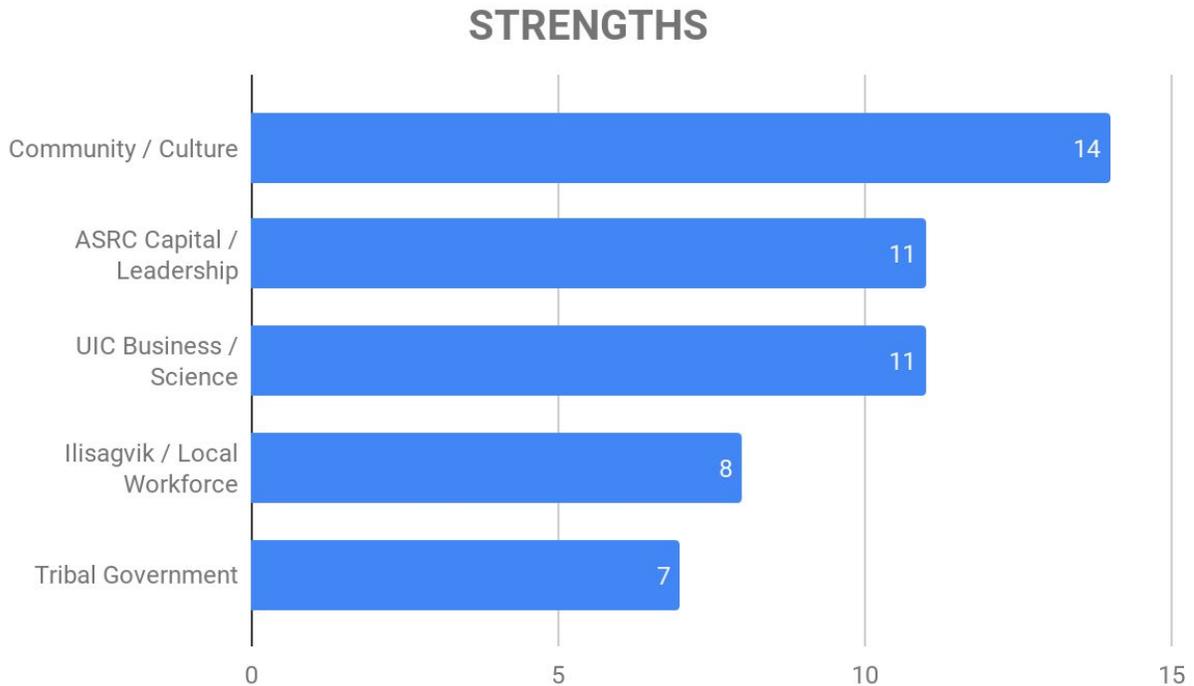


Image 27: 58 individual responses were collected, grouped here into common themes.

Responders demonstrate a clear sense of pride in the **local community and culture**. In terms of economic strategy, objectives which promote subsistence activities, tourism, local art, community and family based small business development are preferred.

There is also a notable confidence and reliance in the tribal entities of **UIC, ASRC, Iḷisaġvik and the NVB**, meaning the community as a whole is confident and hopeful that the leading for-profit entities will also be the motivators for economic development, which bodes well for this strategic planning effort. Leading, although by a small number is **UIC**, who as the majority landowner in Barrow is best positioned to facilitate projects involving for example, housing, road construction and new business development. Similarly **ASRC's** access to investment capital, Alaska Growth Capital as a resource for new business planning and creation, **Iḷisaġvik** providing workforce development opportunities for and the importance of the **NVB** sheer fundraising power through its sovereignty and opportunities for federal grants and loans is recognized eg. USDA, DOT, DOI, DOJ, EDA, etc grants.

### 3.2 WEAKNESSES / CONCERNS

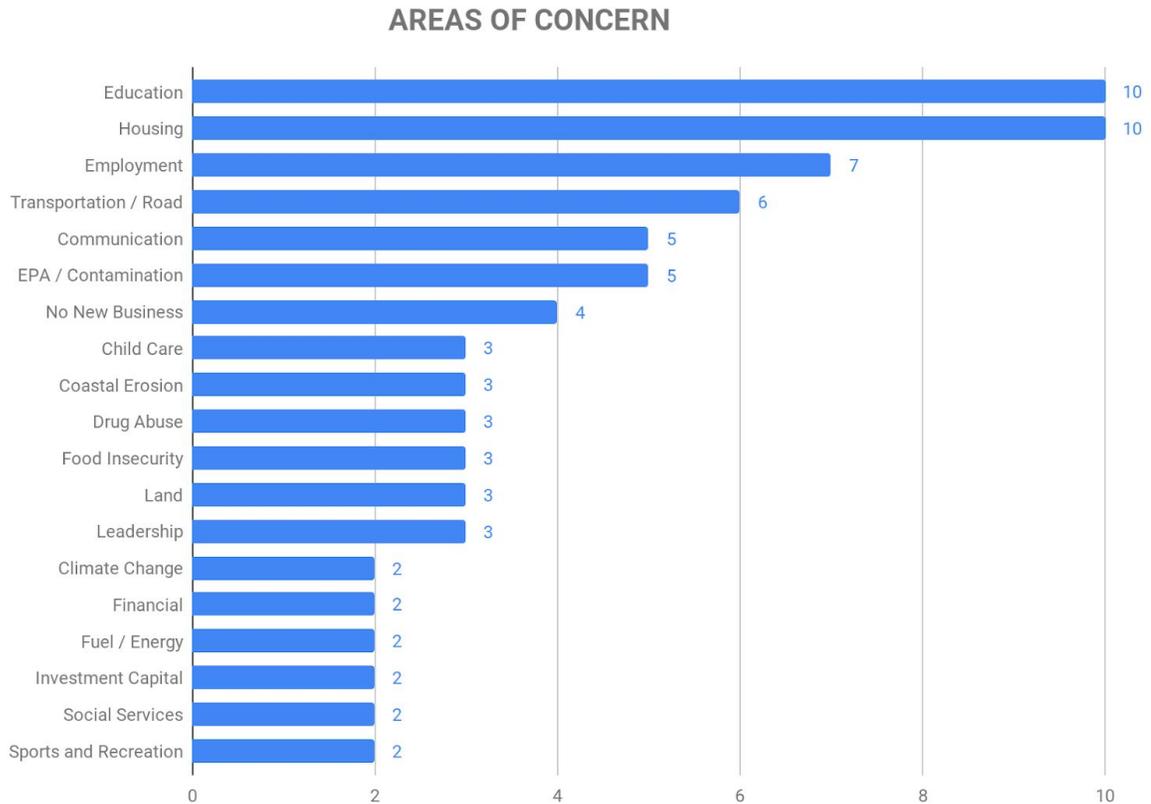


Image 28: 94 individual responses were collected, grouped here into common themes.

The clear themes emerging are a very strong attention to the need for education and housing. The context of the need for **education** focused on two themes: a) the need for higher education so the local workforce can capture higher paying jobs, to oppose outsourcing and b) technical training, cross-training and continuous education opportunities so workers can become more resilient against professional changes, layoffs and downsizing.

**Housing**, often characterized as a "housing crisis" in Barrow also had two themes, a) low- and very-low income housing and b) medium to high quality housing for families, executives, professors, doctors, nurses and business owners, which would give opportunities for local business to grow by attracting skilled workers.

Construction challenges for **roads**, new construction sites, roads out of Barrow, and generally transportation due to EPA and wetlands predominantly in the area were given high importance, however also perceived as insurmountable - which also identifies an opportunity for research.

### 3.3 OPPORTUNITIES

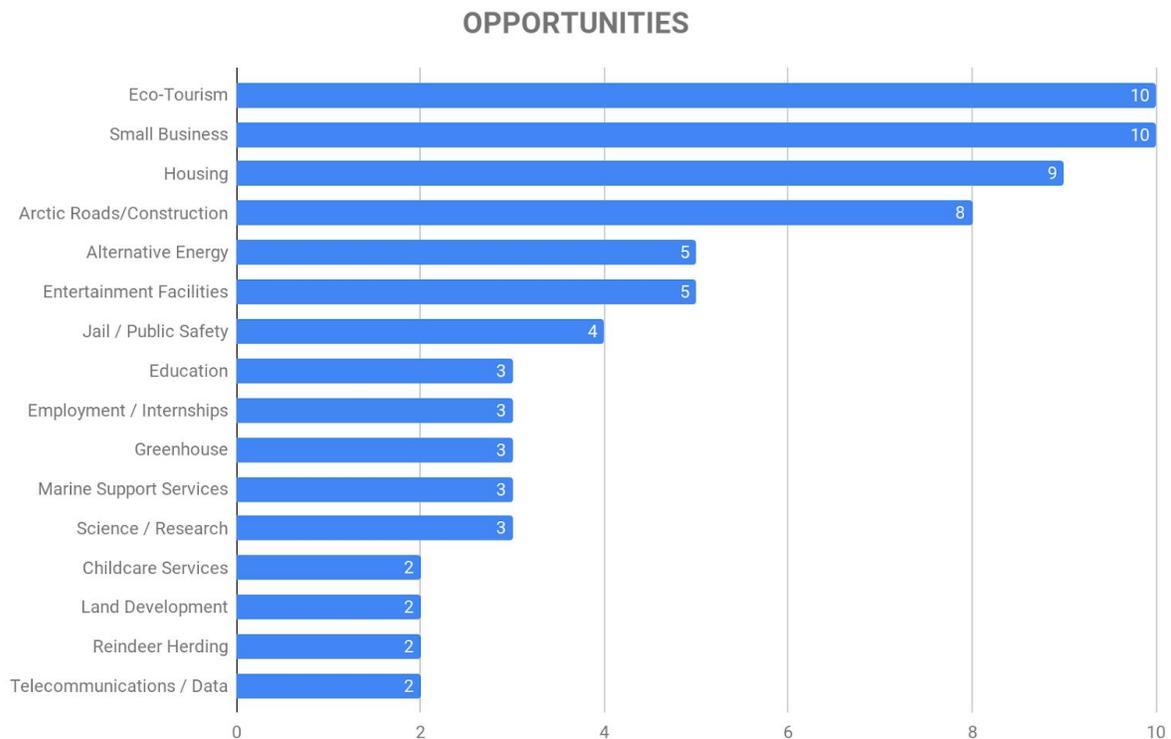


Image 29: 95 individual responses were collected, grouped here into common themes.

**Eco-tourism**, including wildlife, nature, hunting, fishing and scenic tours, including visiting historical sites like Walakpa and the Naval Arctic Research Lab (NARL) and subsistence employment opportunities, e.g. hunter as an occupation were discussed. The **Small Business development** bar includes a number of suggestions which are currently missing or lacking from Barrow, such as hairdressers, beauty salons, print shops, coffee shops, clothing stores and sports shops and providing for a diversity of safe and affordable **housing**.

**Road construction** on wetlands with permafrost has always been a huge problem in the arctic, but is also seen as an opportunity to create an innovative approach and build "in-house" expertise through a new construction company focusing arctic road construction.

The secondary grouping of opportunities includes **Alternative Energy**, namely replacing diesel with natural gas which is locally sourced in the Barrow Gas Fields and would save energy costs and provide technical jobs for installation and maintenance, while providing much needed energy independence. **Entertainment facilities**, such as malls, music and movie theaters are desirable, as are **greenhouses** and a coordinated approach to providing **marine support services**, docks, marine landing and staging areas and support logistics.

### 3.4 THREATS

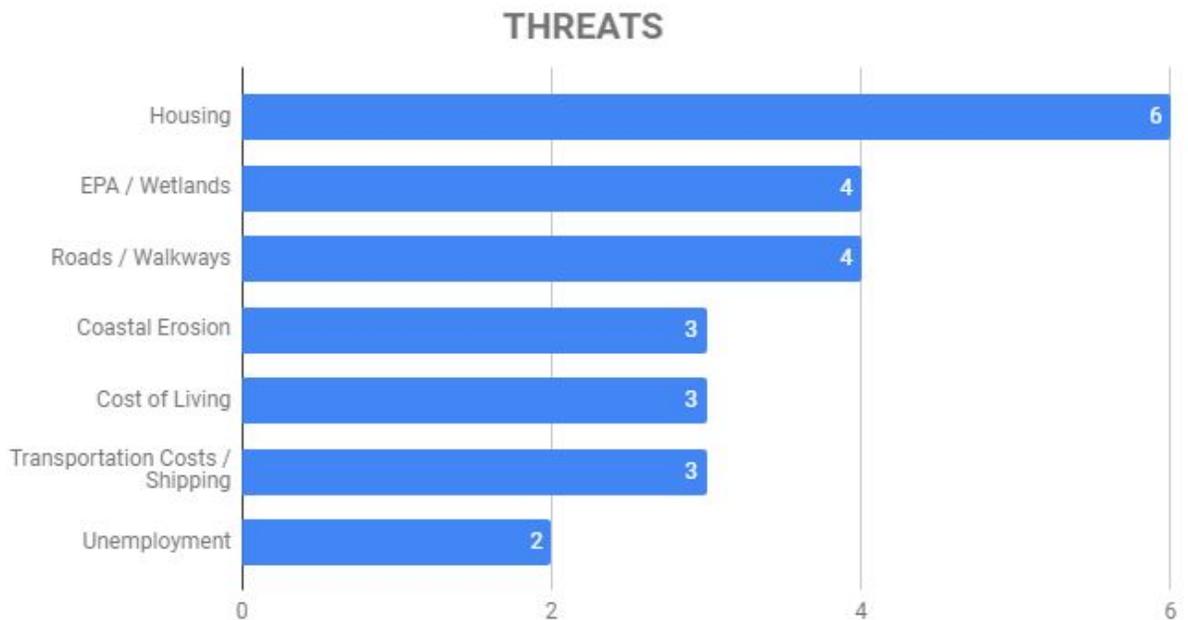


Image 30: 46 individual responses were collected, grouped here into common themes.

**Housing** once again is noted as the highest threat to economic development, with noted impacts to the retention of highly skilled workers, overcrowding and homelessness.

Thoroughly discussed were **EPA regulations and federal oversight** of the lands around Barrow, of which 99% are wetlands, which is true for the rest of the North Slope communities. When compared to other states having 1-2% wetlands which must be protected, the EPA and Army Corps of Engineers will need to understand that applying NEPA regulations to the high arctic tend to feel like "counting the water in the ocean with a teaspoon", to quote one of our participants. The way to address this is to approach the EPA with a request to allow local self-determination of NEPA regulations by local governments.

The quality of **roads** in Barrow, namely packed dirt roads and the lack of walkways and sidewalks was flagged as crucial in the village where, despite the cold, many people walk to work and most children walk to school. Combined with the **high cost of living, high cost of travel** in and out of the village and the **lack of an emergency evacuation route**, or road out of Barrow / road to Atqasuk and/or Wainwright these threats compound the issue of **retention** of both skilled workers and local residents, especially young families.

### 3.5 BIG IDEAS

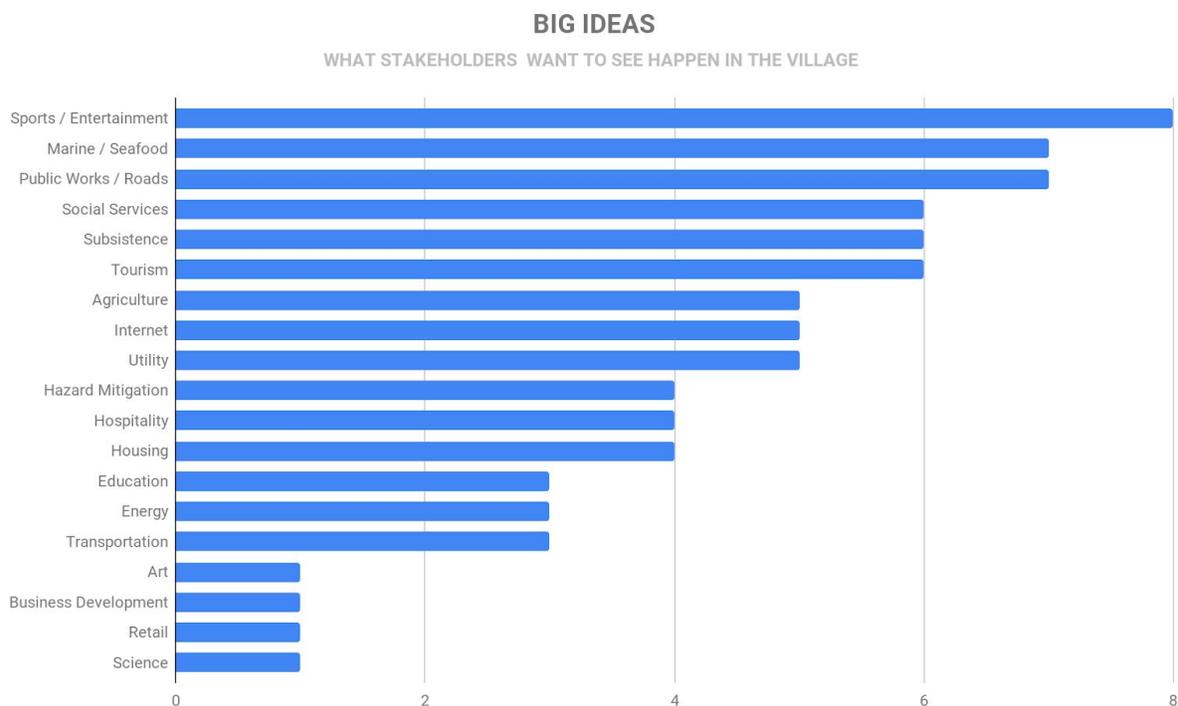


Image 31: 80 big ideas were collected, grouped here into industry clusters.

"Big Ideas" was an exercise conducted alongside the SWOT meetings, where the public has the opportunity to share wild ideas and overlooked necessities to arrive at a qualitative Vision for the economic future of Barrow. The collective results read as a statement of "What we want to see happen in the Village in the next decade" and gives us the opportunity to connect the CEDS to the perception and the reality of progress being made towards improving Quality of Life.

The individual ideas offered were grouped into industry sectors<sup>21</sup>, where economic investment in a broad sense is desirable. Six brackets emerge, which we list here for clarity in terms of "interest". While each are individually important, some gauge how urgent and desirable they are:

Table 3: Big Ideas listed in terms of interest, as it relates to community vision for the village

1 - HIGHEST	2	3	4	5	6 - LOWEST
Sports / Entertainment	Social Services	Agriculture	Hazard Mitigation	Education	Art
Marine / Seafood	Subsistence	Internet	Hospitality	Energy	Business Center
Public Works / Roads	Tourism	Utility	Housing	Transportation	Retail Stores

<sup>21</sup> Detailed "Big Ideas" can be found in Appendix C.

## 4. STRATEGIC DIRECTION / ACTION PLAN

### 4.1 STRATEGIC DIRECTION

It is certainly challenging to create an economic development strategy for a village, having any number of needs and concerns, all of which feel urgent. How much more so for Barrow, which is tasked with being the nerve center of the oil rich high arctic, disconnected from the road system and cut off from its ocean for all but three months a year by sea-ice. In a place where thousand year old traditions and culture are as strong as ever and where education, healthcare, transportation, housing, food security and employment are all critical needs, we approach the task of setting a strategic direction by listening to the community's concerns and adding up all the numbers.

Our SWOT analysis showed that Industry Clusters and Strengths are closely matched, which reflects a confidence in the predominantly government based employment base, through the NSB and City of Utqiagvik, and the ANCSA<sup>22</sup> Regional and Village corporations, namely ASRC's and UIC's, business efforts for providing employment options. A CEDS and the implementation effort which follows however, should be an agent for dramatic positive change, established by matching community needs with the incubation of a workforce capable of providing those services which address them.

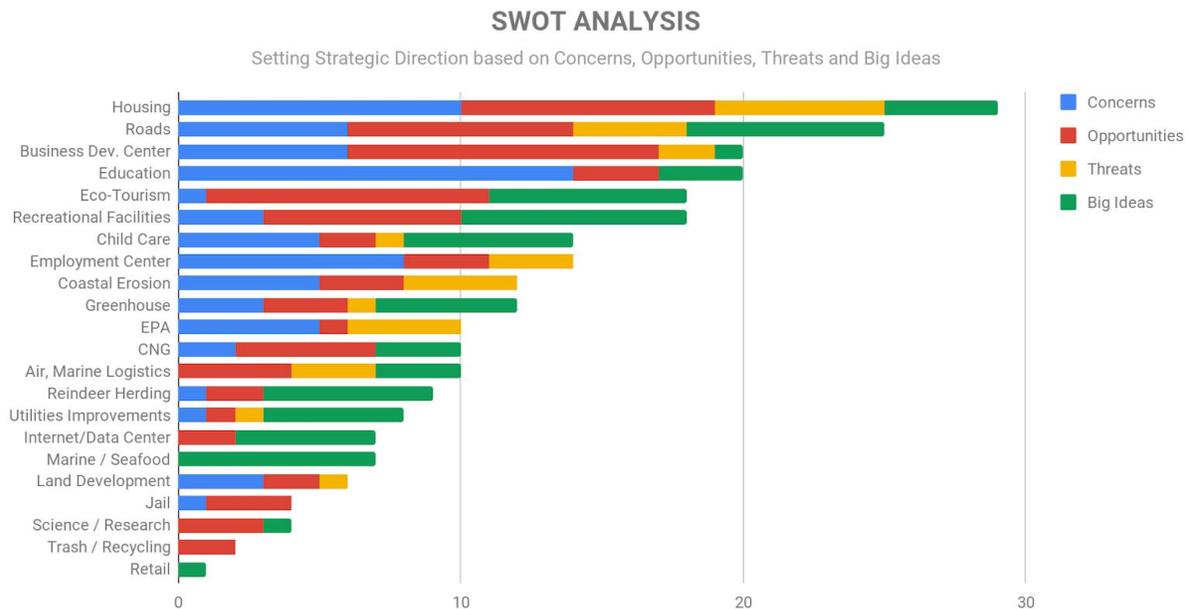


Image 32: In the image above we have stacked and Concerns, Opportunities, Threats and Big Ideas to reveal a ranking of the feedback received. The image in table form follows for clarity.

<sup>22</sup> Alaska Native Claims Settlement Act (ANCSA)

Table 4: *Economic development opportunities identified by collecting SWOT data.*

	Housing	Roads	Business Dev. Center	Education	Eco-Tourism	Recreational Facilities	Child Care	Employment Center	Coastal Erosion	Greenhouse	EPA	CNG	Air, Marine Logistics	Reindeer Herding	Utilities Improvements	Internet/Data Center	Marine / Seafood	Land Development	Jail	Science / Research	Trash / Recycling	Retail
Concerns	10	6	6	14	1	3	5	8	5	3	5	2	0	1	1	0	0	3	1	0	0	0
Opportunities	9	8	11	3	10	7	2	3	3	3	1	5	4	2	1	2	0	2	3	3	2	0
Threats	6	4	2	0	0	0	1	3	4	1	4	0	3	0	1	0	0	1	0	0	0	0
Big Ideas	4	7	1	3	7	8	6	0	0	5	0	3	3	6	5	5	7	0	0	1	0	1
Totals	29	25	20	20	18	18	14	14	12	12	10	10	10	9	8	7	7	6	4	4	2	1

We use this ranking to identify and prioritize goals, objects and specific projects in this CEDS.

## 4.2 VISION STATEMENT

CEDS 2012 VISION: “Our vision for development is to become a tribe that is self-sustaining, rich in culture and tradition that will blend the paths of the old and the new in a way that preserves the Iñupiat traditional knowledge and way of life that unites us as one people in the respect, values, and memory of our ancestors.”

CEDS 2018 VISION: "Barrow is and will continue to be a village that fosters and values a strong sense of community through diversity, an active subsistence lifestyle, multi-generational traditional knowledge and traditional Iñupiat values while also embracing new technological advancements and contemporary knowledge. Residents and community leaders will guide community growth and development in a coordinated, cost effective, efficient and environmentally sensitive manner that respects and protects local wildlife habitats and the area’s abundant natural resources. Barrow’s education system will prepare its youth through training opportunities and college programs tailored to meet the employment needs of the local community, science research and industry. There will be a diversity of safe and affordable housing opportunities and well-maintained and reliable utilities and other public infrastructure and community facilities. Residents will have a variety of recreational opportunities, especially for families and youth that facilitate healthy living and an active lifestyle. Community cooperation, transparency and resident involvement will provide a high quality of life."

Our Barrow CEDS 2018 Vision was agreed to match the Barrow 2015 Comprehensive Plan, published by the NSB and thoroughly discussed by all stakeholders.

The goals, objectives and implementation plan which follows relate directly to the SWOT analysis and qualify the CEDS vision.

We have folded in the implementation timelines and individual project evaluation criteria in each objective, when they represent distinct projects to best communicate performance tracking.

## 4.3 GOALS AND OBJECTIVES

### GOAL 1: FOSTER A DIVERSITY OF SAFE & AFFORDABLE HOUSING

#### Objective 1.1: Create Barrow Housing Master Plan

Project Lead: Sam Okakok, Housing Director, NVB  
Responsible Parties: NVB, TNHA  
Timeline: 2018-2019  
Cost Estimate: \$100,000  
Funding Sources: HUD NAHASDA<sup>23</sup>, ICDBG<sup>24</sup>, Tax Credits, USDA Rural Dev, AHFC<sup>25</sup>

#### Description:

A Barrow Housing Master Plan is essential to addressing the housing crisis. The plan will bring together all concepts and opportunities for housing development, including locations, funding mechanisms and strategies. Most importantly the plan will inform potential homeowners of ways to purchase a home of their own. To our knowledge, Barrow has never had a Housing Master Plan, so this task is both timely and instructive under this goal.

There are a number of resources we can use for guidance and suggestions:

- NSB Comprehensive Plan - Section 6. Housing<sup>26</sup>
- NVB Housing Catalog
- HUD Alaska Native Housing Needs Assessment (2010)<sup>27</sup>
- AHFC Consolidated Housing Plan for State of Alaska (2016-2020)<sup>28</sup>
- CCHRC Mertarvik Housing Master Plan (2017)<sup>29</sup>

#### Steps:

1. Establish ownership and funding.
2. Literature Review, Housing stakeholder, Construction and Community review.
3. Write plan, create dedicated website and circulate throughout the community.

#### Evaluation Criteria:

1. Measurements of housing activity, decrease in community housing needs.

---

<sup>23</sup> Native American Housing Assistance and Self Determination Act of 1996 (NAHASDA) (set aside grant)

<sup>24</sup> Indian Community Development Block Grant Program (ICDBG) (competitive grant)

<sup>25</sup> Alaska Housing and Finance Corporation (AHFC) has programs which distributes funds for housing construction, homeless shelters, etc

<sup>26</sup> [http://www.north-slope.org/.../DRAFT\\_Barrow\\_Comprehensive\\_Plan\\_7-7-14\\_file\\_2.pdf](http://www.north-slope.org/.../DRAFT_Barrow_Comprehensive_Plan_7-7-14_file_2.pdf)

<sup>27</sup> <https://www.hud.gov/sites/documents/FINAL-AK-PROCEEDINGS.PDF>

<sup>28</sup> <http://dhss.alaska.gov/gcdse/Documents/Publications/AHFC2016-2020ConsolidatedPlan.pdf>

<sup>29</sup> [https://www.commerce.alaska.gov/web/Portals/4/pub/mertarvik\\_housing\\_master\\_plan.pdf](https://www.commerce.alaska.gov/web/Portals/4/pub/mertarvik_housing_master_plan.pdf)

## **GOAL 1: FOSTER A DIVERSITY OF SAFE & AFFORDABLE HOUSING**

### **Objective 1.2: Create New Low and Very-Low Income Housing**

Project Lead: Sam Okakok, Housing Director, NVB  
Responsible Parties: NVB, TNHA  
Timeline: 2019 - onwards  
Cost Estimate: \$330,000 per home, 2 - 5 homes per year  
Funding Sources: HUD NAHASDA<sup>30</sup>, ICDBG<sup>31</sup>, Tax Credit, USDA Rural Dev, AHFC<sup>32</sup>

#### **Description:**

There is need for approximately 150 homes for families with income less than \$26,000 per year who are currently homeless, in transitional housing or in overcrowded homes living with family in Barrow, who are seeking rental properties or affordable housing options. Many of these families have pre-registered to qualify for NAHASDA funding with the NVB Housing Department, or similar programs with TNHA<sup>33</sup>.

The NVB completed construction of 20 homes between 2016 and 2018 and aims to pursue completion of 2 to 5 low income homes per year for low income housing, depending on funding availability.

#### **Steps:**

1. Coordination housing efforts with NVB and TNHA and seek housing partnerships.
2. Consult with NSB and UIC on identifying locations for new housing development.
3. Secure grant funding and subsidies for home construction.
4. Build homes.
5. Place families into properties.

#### **Evaluation Criteria:**

1. MOU/MOA or otherwise agreement created with TNHA.
2. Home construction sites identified.
3. Grants and funding requests submitted to HUD, USDA, etc agencies.
4. Measure of homes occupied by low-income families (rental or lease to own).
5. Measure of Construction jobs created.

---

<sup>30</sup> Native American Housing Assistance and Self Determination Act of 1996 (NAHASDA) (set aside grant)

<sup>31</sup> Indian Community Development Block Grant Program (ICDBG) (competitive grant)

<sup>32</sup> Alaska Housing and Finance Corporation (AHFC) has programs which distributes funds for housing construction, homeless shelters, etc

<sup>33</sup> The Native Village of Barrow Housing Department and Tagiugmiullu Nunamiullu Housing Authority (TNHA), are both Tribally Designated Housing Entity in Barrow.

## **GOAL 1: FOSTER A DIVERSITY OF SAFE & AFFORDABLE HOUSING OPPORTUNITIES**

### **Objective 1.3: Create Homeless Shelter**

Project Lead: Lars Nelson, Deputy Housing Director, NSB  
Responsible Parties: NSB, NVB, TNHA  
Timeline: 2019  
Cost Estimate: \$500,000 (remodel) - \$5,000,000 (new development)  
Funding Sources: HUD Continuum of Care Grant, NSB Funding, Foundation Funds

#### **Description:**

Homelessness is the harsh climate and housing conditions in Barrow has reached critical levels. At any given time, the NVB has noted 20 individuals and up to 10 families are homeless in Barrow, due legal conditions or just misfortune. They are currently placed in one of 12 transitional apartments owned by the NVB or put up in hotels around town.

The NSB Housing Department has also recognized the need for a dedicated homeless shelter which can be operated for this purpose. The NSB owns 12 12-plexes which are managed by TNHA which may serve this purpose.

#### **Steps:**

1. NSB consults with TNHA and NVB on identifying a suitable space for the shelter.
2. Submit HUD Continuum of Care Grant (September 18, 2018).
3. Pursue and secure additional funding from NSB and Rasmuson Foundation.
4. Create construction budget and secure construction or renovation crew.
5. Complete business and safety plan for operation and management of shelter.
6. Commission shelter to use and management either by NVB or TNHA.

#### **Evaluation Criteria:**

1. Site for shelter identified.
2. HUD CoC Grant submitted.
3. Funding secured.
4. Project Budget, Management and Operations Plan created.
5. Shelter commissioned to use.
6. Measure of homeless people served.
7. Measure of homeless people placed in permanent homes.
8. Measure of associated cost savings or improvement in quality of life.
9. Measure of construction jobs and shelter staffing jobs created.

## **GOAL 1: FOSTER A DIVERSITY OF SAFE & AFFORDABLE HOUSING OPPORTUNITIES**

### **Objective 1.4: Create Family Homes and Apartments for Skilled Workers**

Project Lead: Richard Reich, GM Community Economic Development, ASRC  
Responsible Parties: ASRC, UIC, NVB, NSB  
Timeline: 2020 - 2022  
Cost Estimate: \$6,000,000  
Funding Sources: AHFC, ASRC, UIC, Development Loans, EDA

#### **Description:**

There is a reasonable availability of jobs for skilled workers in Barrow, from Professors, Doctors, Nurses, Engineers, Scientists, Managers, Oil Industry, Accountants and a number of State and Federal employment options. There are also a growing number of young professionals who are returning to Barrow to start their families, after completing their higher education or exploring job options elsewhere, who wish to live in their village. Being able to attract and keep such individuals and families in the village where they may contribute to the economic growth requires the availability of appropriate housing.

We propose to design, build or remodel 10-15 new homes and/or apartments in Barrow for skilled workers. We estimate \$250,000 - \$350,000 for remodels and \$500,000 - \$600,000 for new construction.

#### **Steps:**

1. Identify existing homes which can be purchased and redecorated in Barrow.
2. Identify sites for new home construction in Barrow in close proximity to services.
3. Secure funding by partners.
4. Create design plans for each remodel, home and apartment identified.
5. Begin Construction.

#### **Evaluation Criteria:**

1. Sites prioritized by the locations suitable for infill and existing utility connections.
2. Plans developed.
3. Funding secured.
4. Measure of new homes created or remodeled.
5. Measure of new homes occupied (rented or sold) to skilled workers.
6. Measure of impact to local economic by retaining skilled workers vs outsourcing.

## **GOAL 1: FOSTER A DIVERSITY OF SAFE & AFFORDABLE HOUSING OPPORTUNITIES**

### **Objective 1.5: What does a Modern Alaskan Home in the High Arctic Look Like?**

Project Lead: Andreas Tziolas, CEDS Project Manager, NVB  
Responsible Parties: NVB, ASRC  
Timeline: 2019 - 2021  
Cost Estimate: \$1,000,000  
Funding Sources: HUD, USDA, DOE, EDA, Business Development Grants/Loans

#### **Description:**

Every country and culture around the world has a traditional architecture which identifies them. Even as they modernize, a person visiting an island in Greece, a village in Switzerland, Denmark, Iceland or Norway will identify the influences of that culture in the surrounding buildings and homes. The costs of shipping and construction in Barrow and other villages in the High Arctic, have forced almost all housing agencies and builders in rural Alaska to settle for a overused classic - functional yet amorphous - style. Often shrunk in size due to material weight costs of shipping and necessarily placed on pilings, these "stick built" homes serve their purpose in providing shelter, but otherwise fail to invoke a culturally informed architectural style.

We propose to ask the question: "*What does a Modern Alaskan Home in the High Arctic Look Like?*". We approach this as a highly experimental, high-risk, high-return, community and culturally driven opportunity to identify floor plans and architectural styles which conceptualize what the future modern Barrow city-scape might look like.

From this effort, we aim to create a Arctic Construction Company which specializes in building modern, beautiful, functional and sustainable rural Alaskan homes.

#### **Steps:**

1. Identify technical assistance program funding through grants and investments.
2. Create project plan for community engagement. Iterate design approaches.
3. Examine the current lifestyles and needs of Iñupiat and local residents of Barrow, modern needs, use of technology, family spaces, workspace requirements for subsistence activities and living in the arctic.
4. Work outwards, re-examining standard building approaches, costs of manufacturing, cost of maintenance and repair and quality of life.
5. Create various CAD models and conduct model thermal performance modelling.
6. Identify alternative construction materials and construction approaches.
7. Pursue construction of a model home.
8. Create an Arctic home design and construction company.

**Evaluation Criteria:** Steps completed. We arrive at an answer to the question as posed.

## **GOAL 2: CREATE NEW ROADS AND ROAD CONSTRUCTION METHODS**

### **Objective 2.1: Shareholder Lot Roads Phase 2-5**

Project Lead: Charles Brower, President, Tribal Transportation Manager, NVB  
Responsible Parties: NVB, NSB  
Timeline: 2019-2021  
Cost Estimate: \$15,000,000  
Funding Sources: DOT BUILD, FEMA, EDA

#### **Description:**

In 1992, UIC conveyed a number of home site lots to shareholders who did not have family homes in village, to private ownership. These lots will become accessible through this East Barrow Shareholder Lot roads construction project, to allow housing units to be built. A project is underway to provide opportunity for approximately 255 new homes to be constructed alongside the new hospital, alleviating the housing crisis. To meet future demand, by 2035 Barrow will need 515 housing units beyond Barrow's current housing stock.

Completing this project will have an incredible impact on the local economy. It will help stabilize the housing (rental and ownership) costs, alleviate overcrowding and spur financial growth by creating over \$40 million in property costs (lot + homes), not to mention public works and utility contracts and incentives for creating new local stores. The site is located adjacent to the new hospital and the proposed site for the new tribal college.

#### **Steps:**

1. Project plan, NEPA and 66% designs have been completed (UMIAQ).
2. Pursue DOT BUILD Grant funding in FY19 (submitted May 2018)
3. Complete construction of the road by 2021 and commission the road to use.

#### **Evaluation Criteria:**

1. Project assessment complete.
2. Grants submitted and supplementary funds appropriated.
3. Road construction completed.
4. Economic Resiliency: Opens up 255 lots to new housing construction.

## **GOAL 2: CREATE NEW ROADS AND ROAD CONSTRUCTION METHODS**

### **Objective 2.2: Complete the Uivaqsaagiak Road (BARC Road)**

Project Lead: Charles Brower, President, Tribal Transportation Manager, NVB  
Responsible Parties: NVB, NSB  
Timeline: 2019-2021  
Cost Estimate: \$2,000,000  
Funding Sources: DOT BUILD, FEMA, EDA

#### **Description:**

The Uivaqsaagiak Road, or BARC Road is an alternative path to the Naval Arctic Research Lab where Iḷisaḡvik College and the Barrow Arctic Research Lab are located. Storms frequently overwhelm the sacrificial berm and floods Stevenson St located across the coastline. The NSB and NVB have completed construction of the first phase of building this alternate road, however construction has stopped because of design and quality control factors.

Completing this project greatly increases the resiliency of the region to natural disasters and provides an alternative path and evacuation route for students, scientists and workers at Iḷisaḡvik college, the BARC and the natural gas line facilities located at NARL.

#### **Steps:**

4. Determine current state of construction and funding for completing the road.
5. Pursue DOT BUILD Grant funding in FY19.
6. Complete construction of the road by 2021 and commission the road to use.

#### **Evaluation Criteria:**

5. Project assessment complete.
6. Grants submitted and supplementary funds appropriated.
7. Road construction completed.
8. Economic Resiliency: Cost savings determined from avoiding business and college closures.

## GOAL 2: CREATE NEW ROADS AND ROAD CONSTRUCTION METHODS

### Objective 2.3: Research and Develop New Methods for Building Arctic Roads

Project Lead: Andreas Tziolas, CEDS Project Manager, NVB  
Responsible Parties: NVB, NSB, City of Utqiagvik, ASRC  
Timeline: 2020-2023  
Cost Estimate: \$3,000,000  
Funding Sources: DOE, DOT, NSF, EDA

#### Description:

Roads in Barrow are constructed by compactifying dirt. The NSB spends approximately \$2M per year on surfacing and road maintenance operations<sup>34</sup>. \$400k is spent per year on watering trucks for dust abatement and \$80k per year on dust stabilization treatments. Building and maintaining roads in the presence of wetlands and permafrost have been the subject of much research dating back many decades.

Recent advancements in road grating, surfacing and stabilization techniques provide an opportunity to pursue new methods of paving roads in the high arctic. For example soil-cement mixtures<sup>35</sup>, use local aggregate and only 5-10% mixture of cement, lime and organic resins, which are finished with a thin bituminous surface. In fact, the US Army used this method to pave most rural roads in Alaska and 90% of rural roads in Australia built in the 1960s are still in use today. Rigid insulation used to provide stability and insulate the permafrost can be replaced with eco-friendly solutions which use natural fibers (eg. kenaf, industrial hemp), safer to humans as they find their way into the water sources adjacent to roads in Barrow.

On completion of this feasibility study, the project will at a minimum update best-use practices for creating arctic roads. If the experimental roads are satisfactory, we will pursue the development of an Arctic Road Construction company.

#### Steps:

1. Secure funding from DOE, DOT, NSF, EDA.
2. Create literature review and on-site inspection of similar roads.
3. Determine locations for experimental road creation.
4. Procure materials and machinery and create experimental roads for testing.

#### Evaluation Criteria:

1. Project steps completed, as stated.
2. Measuring road performance and cost construction and maintenance.

---

<sup>34</sup> [NSB Public Works Budget 2017-2019. \(ref: 6105.ROADS\).](#)

<sup>35</sup> <http://www.cement.org/cement-concrete-applications/paving/soil-cement>

## **GOAL 2: CREATE NEW ROADS AND ROAD CONSTRUCTION METHODS**

### **Objective 2.4: Barrow Walkway and Sidewalks Project**

Project Lead: Andreas Tziolas, CEDS Project Manager, NVB  
Responsible Parties: NVB, NSB, UIC, City of Utqiagvik  
Timeline: 2019-2020  
Cost Estimate: \$6,000,000 - \$8,000,000  
Funding Sources: FHWA DOT, BIA, DOI, EDA, Rasmuson Foundation

#### **Description:**

Despite the harsh cold and road conditions, Barrow is very much a walking town. Many people walk to work and most children walk to school and the SWOT meetings revealed the interest in creating safe sidewalks around the village, instead of walking alongside cars on icy and dusty roads.

In 2012 the NVB created the "Barrow Walkway" project which would provide pedestrian access to all public schools, the library, heritage center, post office, City Hall and Piuraagvik (fitness center) and to Barrow's city center (bank, ASRC, NSB, UIC, Quick Stop grocery store). A Statement of Support was enthusiastically signed by the NVB, City of Utqiagvik, NSB and UIC.

This project works alongside our CEDS goals for **Roads** and **Tourism**, as the Barrow Walkway will create opportunity for safe walking tours of the village, bird watching and sightseeing.

#### **Steps:**

1. Pursue a NSB CIPM<sup>36</sup> Feasibility Study.
2. Secure funding through FHWA DOT, BIA, DOI, EDA and Foundation Funding.
3. Secure Right of Way, Permission to build from City, State and Private owners.
4. Construct walkway and commission to use.
5. Create Barrow Walkway tourism marketing program.

#### **Evaluation Criteria:**

1. Funding secured.
2. Feasibility and Project Design completed.
3. Walkway constructed.
4. Survey community quality of life improvement feedback.
5. Evaluate the success of the project as a tourist attraction.

---

<sup>36</sup> NSB Capital Improvement Program Management.

## GOAL 2: CREATE NEW ROADS AND ROAD CONSTRUCTION METHODS

### Objective 2.5: Planning a Permanent Road to Atqasuk

Project Lead: Charles Brower, President, Tribal Transportation Manager, NVB  
Responsible Parties: NVB, NSB, ASRC, UIC - UMIAQ  
Timeline: 2020  
Cost Estimate: \$2,000,000  
Funding Sources: USDA Rural Energy Saving Grant, DOT BUILD, NSB PAR, EDA

#### Description:

The idea of a road to Atqasuk (pop. 200) is not a new one. The NSB has funded two feasibility studies for the a 68 miles power transmission line project from Barrow to Atqasuk, which has studied the least impactful path to the village<sup>37</sup>, to lower diesel heating and power fuel costs. The NSB is planning on constructing 200 miles of winter roads connecting Barrow to the Dalton Highway and Atqasuk<sup>38</sup> in 2018-2019, which will be a "convoy escorted" road with significant potential for cost savings. The State of Alaska has commissioned the Alaska Strategic Transportation And Resources<sup>39</sup> (ASTAR) study to connect the villages in the North Slope with the Dalton Highway, to alleviate logistical costs. All together these actions show interest and determination to create such roads throughout the North Slope, with the lowest hanging fruit being Atqasuk.

The purpose of this effort is to "put the project on the books", as it were and create a permanent road to Atqasuk. The NEPA requirements are understood, although final determination and budget for a road is still pending.

Completing this project opens up opportunities for economic growth and economic resiliency for both Barrow and Atqasuk. Natural gas extracted from the Barrow Gas Fields can be used to "gasify the village", fostering the region's energy sovereignty. The Airports will be linked allowing for alternative landing areas in case of emergency in either village. Hunting, Fishing and Reindeer herding industries and eco-tourism destinations can around Atqasuk and linked to Barrow. Last but not least, during World War II, coal was mined in the community and freighted to Barrow, which implies the presence of higher quality gravel and other mining resources in the area. Such gravel is necessary for new construction especially in Barrow and may provide alternative solutions to dealing with coastal erosion.

**Steps:** Determine current state of the effort, create planning committee and pursue.

---

<sup>37</sup> [NSB, Atqasuk Transmission Line Project Update, 2013](#)

<sup>38</sup> [ADN, "New snow roads will link Alaska's road system to Arctic communities" \(March 18th, 2018\)](#)

<sup>39</sup> [ASTAR homepage](#)

## **GOAL 3: PROMOTE AND EXPLORE NEW BUSINESS DEVELOPMENT**

### **Objective 3.1: Barrow Economic Development Corporation**

Project Lead: Andreas Tziolas, CEDS Project Manager, NVB  
Responsible Parties: NVB, AGC, ASRC, Iḷisaḡvik College  
Timeline: 2018-2019  
Cost Estimate: \$250,000 - \$500,000  
Funding Sources: EDA, ASRC

#### **Description:**

There are a number of Alaska Regional Development Organizations<sup>40</sup> (ARDORS) in Alaska which have proven to be an incredible resource for new business and motivators for economic growth. Through this renewed CEDS we aim to pursue creation of a Barrow Economic Development Corporation (BEDC), to serve a number of functions, as highlighting in our SWOT analysis:

- a. Apply for Barrow designation as an Economic Development District.
- b. Coordinate CEDS updates.
- c. Create NVB CEDS website and demographic, socioeconomic and business map.
- d. Promote local business development.
- e. Provide business and financial management opportunities.
- f. Act as Employment Center, collecting information on employment opportunities,
- g. Assist job seekers with job applications and resumes.
- h. Create seed funds and revolving loan funds, for new business development and business expansion.
- i. Work with venture capital groups, banks and local business concerns to create capital funding opportunities for local businesses.

The BEDC will work alongside ASRC's Alaska Growth Capital and CEDS partners to identify opportunities for business development and economic growth.

#### **Steps:**

1. Secure funding.
2. Create business plan, staffing and operations manuals.
3. NVB Council approves the creation of the BEDC. Stakeholder MOUs signed.
4. Office location secured, staff hiring and office equipped.

#### **Evaluation Criteria:**

1. Steps completed.
2. Measurements of economic impact, business, job creation, wealth creation.

---

<sup>40</sup> <https://www.commerce.alaska.gov/web/ded/dev/ardors.aspx>

## GOAL 3: PROMOTE AND EXPLORE NEW BUSINESS DEVELOPMENT

### Objective 3.2: Repository of Business Opportunities

We collect here concepts for new commercial developments, representing opportunities for broadening the business landscape in Barrow.

- **Concept 3.2.1: Barrow Shopping Mall**

Possible Leads: UIC, ASRC, Private Business  
Timeline: 2020-2023  
Cost Estimate: \$30,000,000 - \$60,000,000  
Funding Sources: EDA, ASRC, UIC, Venture Capital

**Description:** Barrow needs a new location for small businesses and retail stores. Building surveys have not identified an appropriate existing space, so a new construction is needed. The community has asked for a structure which would include a food court, movie theater, bowling alley and small specialty shops. A possible location for the Mall would be adjacent to the new Hospital. Placing it along Cakeater Rd however would help "pull" the village inland.

**Economic Advantage:** Jobs, entertainment, retail business creation. A mall would be a successful investment in Barrow, given there are no public spaces of this sort. If a food court and movie theater were incorporated, the mall would have multiple revenue streams, where the property owner would earn a percentage of profits, plus rent.

- **Concept 3.2.2: Movie Theater**

Possible Leads: ASRC, Private Business  
Timeline: 2021-2022  
Cost Estimate: \$1,000,000 - \$10,000,000  
Funding Sources: EDA, ASRC, UIC, Venture Capital

**Description:** A movie theater is missing from Barrow, which for a village of its size and position in the North Slope is surprising. There are a number of commercial two story buildings which could be retrofitted to create a small independent "boutique" theater. A larger theater would require new construction.

**Economic Advantage:** A movie theater would undoubtedly fill a significant gap in the entertainment offerings in Barrow, creating 3-5 jobs and improving quality of life.

### GOAL 3: PROMOTE AND EXPLORE NEW BUSINESS DEVELOPMENT

- **Concept 3.2.3: Cozy Coffee Shop**

Possible Leads: UIC, ASRC, Private Business  
Timeline: 2018-2023  
Cost Estimate: \$200,000 - \$400,000  
Funding Sources: EDA, ASRC, UIC, Venture Capital

**Description:** There are a number of local eateries in Barrow, but only one small coffee shop with limited seating. An opportunity exists for a young entrepreneur to start a cozy coffee shop with a warm environment, snacks and internet service.

**Economic Advantage:** Creation of 2-3 jobs. Improves quality of life, provides for locals and visitors things to do in Barrow.

- **Concept 3.2.4: Conference Center**

Possible Leads: UIC, ASRC, Private Business  
Timeline: 2018-2023  
Cost Estimate: \$20,000,000  
Funding Sources: EDA, ASRC, UIC, Venture Capital

**Description:** A conference center capable of hosting large audiences and technical presentations would work in conjunction with efforts to develop the tourism and visitor industry in Barrow. In most cases, conference rooms are built into hotels having restaurants and amenities to capture the cost of room and board. The Top of the World Hotel fits the bill, but has limited conference space. A reasonable size meeting space is available at the Iñupiat Heritage Center, also used for occasionally for such purposes, but lacks amenities.

**Economic Advantage:** Approached independently or incorporated into a hotel or mall construction, a conference center is a missing space in Barrow with potential to attract a new revenue sources.

### GOAL 3: PROMOTE AND EXPLORE NEW BUSINESS DEVELOPMENT

- **Concept 3.2.5: Nice Restaurant, Pizza and/or Burger Place**

Possible Leads: UIC, ASRC, Private Business  
Timeline: 2018-2023  
Cost Estimate: \$1,500,000  
Funding Sources: EDA, ASRC, UIC, Venture Capital

**Description:** A unique eating experience is part of every tourist destination. A high end restaurant offering a fine dining experience is missing from Barrow. For Barrow this means sparing no expense and most likely a new construction, or a redevelopment project. This general need for a new restaurant, pizza place, burger joint, etc has been discussed for a very long time and it would be interesting to see what might make its way onto the menu.

**Economic Advantage:** A high end restaurant in the United States makes about \$15,000 per seating<sup>41</sup> with 40% return on investment with land purchase. These numbers will be very different for Barrow, but a restaurant serving local food will also become a favorite to local residents. A restaurant also creates 6-8 local jobs.

- **Concept 3.2.6: Recycling Station**

Possible Leads: Private Business  
Timeline: 2018-2023  
Cost Estimate: \$250,000  
Funding Sources: USDA, EDA

**Description:** A recycling station, metal scrapper constructed as a shop with enough space for stripping machine parts would help remove old vehicles, snow machines and trash from the streets. The business could be subsidized by the NSB under contract.

**Economic Advantage:** 2-4 workers are needed with basic tinkering skills or mechanical engineer. The business could start essentially with an empty workspace and a flatbed or tow truck and be scalable to full metal scrapping, plastics and paper recycling. Grants for equipment and business development used for waste disposal/ sanitation are available by the USDA.

---

<sup>41</sup> <https://www.restaurantowner.com/public/How-Much-Does-it-Cost-to-Open-a-Restaurant.cfm>

### GOAL 3: PROMOTE AND EXPLORE NEW BUSINESS DEVELOPMENT

- **Concept 3.2.7: Hydroponic Farm Business**

Possible Leads: Andreas Tziolas, CEDS Program Manager, NVB  
Timeline: 2019-2020  
Cost Estimate: \$500,000  
Funding Sources: USDA, EDA

**Description:** Hydroponic farm technology has matured significantly to near full automation. The concept has been deployed successfully in Kotzebue thanks to an Alaskan company called Vertical Harvest, which sells containers with hydroponic grow equipment<sup>42</sup>. Produce is sold in the local AC store. The technology can be created anywhere however, with space being the only limitation, given power is relatively affordable as it is generated from natural gas extracted locally.

**Economic Advantage:** A business plan for developing a hydroponic/aeroponic garden business to serve Barrow would be very interesting. It is a very scalable business and would appeal to young entrepreneurs. Produce could be sold in the AC store or directly out of the Farm, if centrally located. Given the population size in Barrow, is it likely all of the produce would be sold. A hydroponic farm would provide jobs for 2-4 people and help alleviate food insecurity, although producing enough vegetables for the whole village would require many acres of land and vertically deployed production<sup>43</sup>.

- **Concept 3.2.8: Indoor Activity Grounds for Kids**

Possible Leads: Private Business  
Timeline: 2020-2023  
Cost Estimate: \$20,000 - \$150,000  
Funding Sources: ASRC, AGC, Private, Venture Capital

**Description:** An indoor activity area for kids is needed. Something which can combine bouncy mats with a calm place for parents to have tea and coffee while watching over children would be a wonderful addition to Barrow.

**Economic Advantage:** Community building, private company. Would create 2-5 new local jobs.

---

<sup>42</sup> [http://www.thearcticsouder.com/article/1628arctic\\_greens\\_sets\\_example\\_for\\_northern](http://www.thearcticsouder.com/article/1628arctic_greens_sets_example_for_northern)

<sup>43</sup> A hydronic farm with 15 varieties requires about 750 sqft of space to feed a family of 4 [ref].

### GOAL 3: PROMOTE AND EXPLORE NEW BUSINESS DEVELOPMENT

- **Concept 3.2.9: Child Care and Day Care Centers**

Possible Leads: NVB, NSB, Iḷisaḡvik College, Private Business  
Timeline: 2018-2023  
Cost Estimate: \$500,000 - \$1,500,000  
Funding Sources: HHS ACF<sup>44</sup>, IHS

**Description:** This concept received one of the highest scores in our strategic analysis, as a vital need. The NSB operates a Child and Youth Services facility for 14 children in critical risk. The NVB Social Services Department expressed a need for 60 children in need of foster care and are too short staffed to meet current needs. A daycare center operated in Barrow until it was closed down in 2006 due to lack of funding. A NSB Project Analysis Report (PAR) was prepared in 2013, showed need for services to 250 children and a new Barrow Early Learning Center was reported completed in 2018. The need for child support services of all types is apparent.

**Economic Advantage:** Encouraging families to start Home Daycare Centers may be the way to go, to alleviate the current strain and a way of stay at home parents to creating a sustainable home businesses. Some licensing and training is needed, which are readily available by the State of Alaska Department of Health and Human Services<sup>45</sup> A home child care center with 5 children at \$45 a day would make \$1,125 a week, and most government jobs provide employee daycare allowances.

- **Concept 3.2.10: Substance Abuse Center and Jail**

Possible Leads: NVB, NSB, Private Business  
Timeline: 2018-2023  
Cost Estimate: \$20,000,000 - \$150,000,000  
Funding Sources: HHS, IHS, DOJ, NSB PAR

**Description:** A Tribal Jail, Substance Abuse Center and Alcohol Detox Center are all missing from Barrow. A PAR was conducted in 2009 which included an updated Police Department, projected at \$135M and was abandoned. The NVB was awarded a DOJ award of \$4M for a Juvenile Detention Facility, but the project failed to achieve traction.

**Economic Advantage:** Explore the feasibility of a "Small Native-Owned Private Jail or Substance Abuse Center", by creating a business plan. While unorthodox, the approach keeping treatment costs in the village and assures cultural traditions are maintained.

---

<sup>44</sup> [Department of Health and Human Services, Administration for Children and Families](#)

<sup>45</sup> [AK DHHS Introduction to Child Care Licensing.](#)

### GOAL 3: PROMOTE AND EXPLORE NEW BUSINESS DEVELOPMENT

- **Concept 3.2.11: Develop Business of Local Grocery Store in Barrow**

Possible Leads: NVB  
Timeline: 2019-2021  
Cost Estimate: \$500,000 - \$1,500,000  
Funding Sources: EDA, USDA

**Description:** The NVB Tribal Council has called for the stand up of a new Tribal Store, Grocery Store, or for the operation of the Grocery Store currently operating in Barrow by Alaska Commercial Company. "AC Store" property is owned by UIC.

**Economic Advantage:** The NVB operating a grocery store in Barrow, or taking over operation of a grocery store has many advantages, including a) addressing food sovereignty, b) retaining economic wealth within the community, c) providing a central organizing unit for food distribution programs, d) providing stable employment to the local population and e) increasing economic leverage of the NVB, eg. by creating a Section 17 Tribally Owned corporation.

- **Concept 3.2.12: Purchase Mixed use Commercial Space in Barrow**

Possible Leads: NVB  
Timeline: 2019-2021  
Cost Estimate: \$500,000 - \$1,500,000  
Funding Sources: EDA, USDA

**Description:** The NVB needs access to land to implement programs, rentals, business development. The NVB will assess local properties for commercial, residential or mixed business opportunities to promote future growth.

**Economic Advantage:** The NVB acquiring land gives opportunity to motivate local business initiative, create satellite offices - most importantly provide options to the tribe for future development.

## GOAL 4: EDUCATIONAL PROGRAMS FOR SUBSISTENCE AND INDUSTRY

### Objective 4.1: Build New Campus for Iḷisaḡvik College

Project Lead: Diana Solemberger, Director of Community Engagement  
Responsible Parties: Iḷisaḡvik College, NSB, NVB, ASRC, UIC  
Timeline: 2021 - onwards  
Cost Estimate: \$175,000,000  
Funding Sources: USDA, BIA Bureau of Indian Education, Dept. of Education, EDA.

#### Description:

Iḷisaḡvik College is the only Tribal College in Alaska and plays an incredibly important role in workforce education in the Barrow and the North Slope. In 2018 it had the highest enrollment, with almost 800 students currently being served<sup>46</sup>. The college offers courses in Iḷupiat Studies, Business, Information Technology, Allied Health, Emergency Services, Vocational Trades, Heavy Equipment Operations and offers Distance Learning classes. Currently located at NARL, the college is running out of classroom space, and has an increasing need for student and staff housing.

A New Iḷisaḡvik College Campus (NICC) is being planned and in January 2018 announced a RFP for architectural design and construction. The project is designed in phases over a two- to three-year period with construction scheduled to begin once funds have been appropriated.

With Iḷisaḡvik's growth and excellent track record, Barrow has an opportunity to become a "College Town", especially if student housing, book stores and entertainment become more accessible. Through this CEDS we identify the importance to workforce development, employment and job creation and seek to assist in coordinating funds for completing the designs and construction for the new campus.

#### Steps:

1. Assist in securing funding for design and construction of the campus.
2. Assist in identifying academic degree programs for local employment.
3. Create internships, employment programs through CEDS partners for graduates.

#### Evaluation Criteria:

1. Funding raised in support of New Iḷisaḡvik College.
2. Internships and employees served through internship programs.

---

<sup>46</sup> <https://www.ilisagvik.edu/i%E1%B8%B7isagvik-sees-highest-enrollment-to-date/>

## GOAL 4: EDUCATIONAL PROGRAMS FOR SUBSISTENCE, SCIENCE AND INDUSTRY

### Objective 4.2: Reindeer Herding Revitalization Project

Project Lead: Andreas Tziolas, CEDS Project Manager, NVB  
Responsible Parties: NVB, Iḷisaḡvik College, UAF, NSB, ASRC, UIC  
Timeline: 2019 - onwards  
Cost Estimate: \$2,000,000 - \$4,000,000  
Funding Sources: USDA, EDA, AIEDA<sup>47</sup>

#### Description:

Reindeer Herding was once very successful in the lands surrounding Barrow. In 1890 125 Siberian reindeer were introduced to Pt. Barrow to solve the problem of depleted game resources<sup>48</sup>. By 1935 the "Iḷupiat Herd" had expanded to 30,000, stimulated by the decline in the whaling industry. By 1940 however, the advent of the North Slope oil industry, supervision of the herds declined and were eventually absorbed into what is now called the Teshekpuk Caribou Herd amongst others. Deer hunting is now an integral part of subsistence activities in Barrow, both for traditional and cultural purposes but also as a means of supplementing the extremely high cost of food.

In 2017, UIC initiated a Reindeer Revitalization Feasibility Project and held public meetings in Barrow which we met with great interest. The NSB Wildlife Department monitors and tracks the Teshekpuk Herd, to mitigate impacts from oil and gas exploration in the region<sup>49</sup>. The University of Alaska Fairbanks (UAF) has a state of the art Reindeer Research Program<sup>50</sup> and some of the world's highest qualified subject matter experts. The SWOT meetings showed interest in continuing this project.

Market research shows organically farmed reindeer meat is a premium product, with high export opportunities to the Lower 48 and Asian countries, along with a number of other value added products, sausages, antlers, bones used for traditional art. This project creates an opportunity for "subsistence as a profession", addresses food insecurity and eco-tourism activities. The project starts with training a local herders.

#### Steps:

1. Work with UAF to create a project plan for Reindeer Herding in Barrow.
2. Create High Latitude Reindeer Management course at Iḷisaḡvik College or NVB.
3. Secure funds for purchasing animals, slaughter house, barns, grazing permits.
4. Create Herd Management Plans, Meat Market Sales Outlets and enlist herders.
5. Test and deploy.

---

<sup>47</sup> Alaska Industrial Development and Export Authority (AIEDA)

<sup>48</sup> <http://arcticcircle.uconn.edu/NatResources/reindeer.html>

<sup>49</sup> [NSB Wildlife Management, Monitoring The Techepak Herd.](#)

<sup>50</sup> [UAF Reindeer Research Program homepage.](#)

## **GOAL 5: GROW THE TOURISM INDUSTRY IN BARROW**

### **Objective 5.1: Visit Barrow: Eco-Tourism Center**

Project Lead: Andreas Tziolas, CEDS Project Manager, NVB  
Responsible Parties: NVB, UIC, ASRC  
Timeline: 2019 - 2021  
Cost Estimate: \$10,000,000  
Funding Sources: EDA, Venture Capital

#### **Description:**

Statewide, direct visitor industry spending in Alaska is more than \$2.42 billion annually. It generates 38,700 jobs and \$1.3 billion in labor income. Barrow is the northernmost city in the United States and has a unique potential for growing its tourism industry, which is currently essentially untapped. Even so, flights into Barrow are always full of visitors either coming up for work or leisure.

Kivgiq, The Messenger Feast, for example is an international event which attracts visitors from around the Arctic Circle. International Arctic and Polar conferences are hosted regularly and the potential for attracting professional medical, ecological, wildlife, marine biology, oil and gas, engineering, climatology, wildlife and other conferences is proven. Princess cruise ships are often seen passing by, with the village unfortunately out of reach. From sports fishing, hunting, polar bear, whale watching tours to sea-ice excursions, cultural immersion workshops and generally eco-tourism opportunities Barrow's tourism industry is a low hanging fruit. It is even becoming common to see self organized Asian tour groups walking around town and taking in the sites.

To do it right, Barrow needs to marketing, infrastructure and guides, which is the intention of this program.

#### **Steps:**

1. Secure funding from EDA, NSB, State of Alaska, Venture Capital.
2. Incorporate a "Visit Barrow: Eco-Tourism Center" as a tribal government-sponsored entity.
3. Commission a new study of tourism industry options for Barrow.
4. Create Business and Project Plan for a) staffing (tour guides, marketing, clerks, wildlife management, etc), b) infrastructure (websites, vehicles, hotels, destinations) and c) activities (sightseeing, fishing, hunting, cultural immersion).
5. Assist in city clean-up activities.
6. Create tourism packages, market and deploy operations.

#### **Evaluation Criteria:**

1. Job and wealth creation.

## **GOAL 6: ARCTIC MARITIME LOGISTICS STUDY**

### **Objective 6.1: Planning for The Barrow Deep Sea Port**

Project Lead: Muriel Brower, Planning Department, NSB  
Responsible Parties: NSB, NVB, UIC - UMIAQ  
Timeline: 2020 - 2023  
Cost Estimate: \$5,000,000 - 10,000,000  
Funding Sources: DOD, NSB, UIC, EDA, AIDEA

#### **Description:**

Because of its strategic location at the northernmost point in the United States with access to the Chukchi and Beaufort Seas as well as the Arctic Ocean, Barrow is well positioned to serve as a hub for Arctic multi-modal transportation. Industry, government, and private user groups have publicly stated that a port along the Arctic Coast of Alaska is needed with increasing immediacy due to greater use of the Northwest Passage.

A Barrow port would support a variety of users, ensure safe access and harbor, support efficient shipping and trans-shipment of goods and provide the infrastructure necessary to serve and promote not only traditional pursuits but industries that include tourism, research, oil exploration and development. This concept is still in its infancy; substantial engineering and geotechnical research and analysis would be needed to determine potential locations for the port based on bathymetry, sediment transport patterns, shore protection, gravel resources, etc. and infrastructure needs, such as fuel storage, utilities and road connections.

This project will pursue a coordinated planning effort for the Barrow Port. This is a very costly, very high risk, very high return project, which is also essential as the northern passages become accessible.

#### **Steps:**

1. Secure design and planning funds from DOD, NSB CIPM, EDA, AIDEA.
2. Solicit support from Coast Guard, commercial marine logistics companies.
3. Solicit state, municipal and federal support.
4. Conduct preliminary NEPA assessment.
5. Conduct Operations and Maintenance cost studies.
6. Create 30% design plans.
7. Seek funding to complete project.

#### **Evaluation Criteria:**

1. Steps completed as listed.
2. Statements of Support and Agreements with US Navy, Coast Guard and Marine Logistics companies.

## GOAL 7: INVEST IN ALTERNATIVE FUELS AND ENERGY

### Objective 7.1: Investments in Compressed Natural Gas (CNG)

Project Lead: Andreas Tziolas, CEDS Project Manager, NVB  
Responsible Parties: NVB, NSB, UIC  
Timeline: 2018 - onwards  
Cost Estimate: \$5,000,000  
Funding Sources: EPA, DOT, BIA - TEDC<sup>51</sup>, USDA, AIDEA, EDA

#### Description:

1 gallon of gasoline costs \$7.50 to \$9.00 in Barrow. It is estimated that \$1.5M is spent every year on gasoline. With the Barrow Gas Fields estimated at having 100 to 160 year reserve capacity, shifting vehicles and home heating to natural gas is a low hanging fruit. A CNG conversion kit for 2018 Ford Explorer, costs \$8,000<sup>52</sup>, which translates to recovery of the investment cost in 15,000 - 20,000 miles.

#### Steps:

1. **Action 1: CNG New Vehicle Ordinance:** We propose to pursue region-wide agreements and ordinances which require new vehicle purchases prefer CNG vehicles, when possible. Such an agreement comes at no programmatic cost and has built in cost savings over time to all parties involved, NSB, City of Utqiagvik, ASRC, UIC and NVB. (Cost Estimate: \$0)
2. **Action 2: CNG Retrofit Grant Program:** We propose to pursue DOT Fuels and Vehicle Technology and EPA Clean Diesel grants for CNG retrofits and engine replacements. (Cost Estimate: \$100,000)
3. **Action 3. Build New CNG Refueling Station:** Currently UIC operates the only public CNG station. BEUCI has CNG pumps for use in their own vehicles. We propose to pursue investments for construction of a modern CNG station<sup>53</sup> and grocery store.(Cost Estimate: \$5,000,000)

#### Evaluation Criteria:

1. Promoting local fuel industry and improving economic strength of the region..
2. CNG ordinance signed.
3. Measurement of total and new CNG vehicles operating in Barrow.
4. Measurement of total regionwide cost savings by using CNG.
5. Measurement of additional NSB revenue from increased CNG sales.
6. Measurement of number of vehicles converted to CNG.
7. New job creation for CNG retrofits and maintenance.
8. New CNG gas station built, 2-4 new jobs created.

<sup>51</sup> BIA Tribal Energy Development Capacity (TEDC) Grant Program [\[link\]](#)

<sup>52</sup> <https://www.driveonnaturalgas.com/ford-explorer-bi-fuel-cng-system/>

<sup>53</sup> [Building a Business Case for Compressed Natural Gas in Fleet Applications, NREL \(2015\)](#)

## GOAL 7: INVEST IN ALTERNATIVE FUELS AND ENERGY

### Objective 7.2: Wind and Solar Feasibility Projects

Project Lead: Andreas Tziolas, CEDS Project Manager, NVB  
Responsible Parties: NVB, Iḷisaḡvik College, NSB, UIC  
Timeline: 2021 - 2023  
Cost Estimate: \$500,000 - \$5,000,000  
Funding Sources: DOE<sup>54</sup>, EPA, BIA - TEDC<sup>55</sup>, USDA, AIDEA, EDA

#### Description:

Arctic communities around the world are revisiting investments in alternative energy sources. The Arctic Institute concluded a round of workshops sharing best practices for creating feasibility projects and deploying solar and wind power utility services and micro-grids<sup>56</sup>. The federal government has made available a number of incentives, grants and loan guarantee programs, with emphasis on their deployment in rural areas.

We propose to create a feasibility study for the deployment of solar and wind power stations and assess their performance in Barrow. In time, the new systems may help decrease power costs during the summer and improve the uptime of power. While the village is in need of a redundant power system, solar and wind would not be possible replacements without broad deployment of wind farms which are known to disturb wildlife.

Investing in alternative energy systems even at a small scale, allows the opportunity to create training programs in this growing field.

#### Steps:

1. Pursue grant funding for solar and wind feasibility studies.
2. Determine sites for localized deployment, eg. NVB, NSB, Iḷisaḡvik buildings
3. Pursue the establishment of courses in alternative energy systems installation and maintenance at Iḷisaḡvik college.
4. Evaluate and grow the programs.

#### Evaluation Criteria:

1. Complete steps as listed.
2. Measurement of cost savings from deploying alternative energy systems.
3. Measurement of total power generated and associated costs benefits.
4. Alternative energy courses created at Iḷisaḡvik College, students enrolled.

---

<sup>54</sup> List of 2018 DOE Tribal Energy Deployment Projects [\[link\]](#)

<sup>55</sup> BIA Tribal Energy Development Capacity (TEDC) Grant Program [\[link\]](#)

<sup>56</sup> <https://www.thearcticinstitute.org/best-practices-solar-arctic-infographic/>

## **GOAL 8: BROADBAND INFRASTRUCTURE INVESTMENTS**

### **Objective 8.1: Microwave Internet Backhaul Network**

Project Lead: Andreas Tziolas, CEDS Project Manager, NVB  
Responsible Parties: NVB, NSB, ASRC  
Timeline: 2020 - 2023  
Cost Estimate: \$40,000,000  
Funding Sources: FCC, USDA, HUD, DOL, EDA

#### **Description:**

The Quintillion subsea fiber project was recently completed bringing Gigabit-class broadband service to Barrow. Local telecommunications companies, GCI and ASTAC have begun to provide service packages through this new resource. This invaluable enhances the existing limited satellite dish networks, which were capped at 10 Mbps max and allows projects such as cloud servers, Voice Over IP (VOIP) call centers, e-commerce, scientific and research networks and data centers. As these services grow, our dependency on their reliable operation will also increase.

We propose to pursue planning and construction of a Microwave Internet Backhaul Network using 10-15 microwave towers connecting the fiber optic line from Prudhoe Bay to Barrow. The network will ensure redundancy in telecommunications and broadband networks to protect commerce and public safety in the event of natural or manmade disasters compromising the subsea fiber. It will also provide a framework for connecting Atqasuk, homesteads, hunting and fishing lodges to telecommunications throughout its path. This project also creates incentives for expanding wildlife science, climate change monitoring and gas exploration throughout the NPR-A<sup>57</sup>.

Conceptually strewn along formerly established winter travel routes, the NEPA findings for securing the network could be used to plan a permanent travel route and evacuation path from Prudhoe Bay to Barrow. Economic resiliency of the village greatly increased.

#### **Steps:**

1. Secure design and planning funds.
2. Create project construction plan, operations and maintenance plan and service business plan
3. Secure NEPA certifications and solicit broadband construction funds.

#### **Evaluation Criteria:**

1. Redundant broadband network created.
2. Barrow would own its telecommunications company.

---

<sup>57</sup> National Petroleum Reserve - Alaska.

## GOAL 8: BROADBAND INFRASTRUCTURE INVESTMENTS

### Objective 8.2: Barrow Datacenter: "US Arctic Data Fortress"

Project Lead: Richard Reich, GM Community Economic Development, ASRC  
Responsible Parties: ASRC, UIC, NVB  
Timeline: 2020 - 2023  
Cost Estimate: \$20,000,000 - \$30,000,000  
Funding Sources: NDA, DOD, FCC, DOL, EDA, Venture Capital

#### Description:

The internet is ripe with news about new data centers being created in Norway<sup>58</sup>, Sweden<sup>59</sup>, Iceland<sup>60</sup> and Greenland<sup>61</sup>. The common themes are a) access to redundant cutting edge Tier 1 internet, b) cheap, locally created electricity and c) cold climate. With the Quintillion fiber line in operation and the concept of a Microwave Backhaul Network proposed earlier, Barrow satisfies all three of these requirements.

We propose to begin planning for the creation of a world-class datacenter in Barrow. Datacenter construction and operation costs are well documented<sup>62</sup> and local experience in construction in Barrow can be used to give qualified estimates. The project will require multiple sources of funds and letters of intent from customers before construction begins.

The opportunities for job creation are staggering. We note with reserved enthusiasm that the "KOLOS" data center under construction in Bellangen, Norway (pop 2,500) is said to create "2,000 to 3,000 new jobs and support 10,000 to 15,000 jobs in the area". There is also a marketing opportunity for approaching the US Government as a customer, in securing the safest, most remote US data center as a "US Arctic Data Fortress".

Having a world-class data center in Barrow provides opportunity for local workforce creation, expansion of Iñisaġvik's Information Technology programs and investment in cross-cutting future job markets.

#### Steps:

1. Secure business planning funding.
2. Create local coalition for supporting the new venture.
3. Select possible construction sites and create server hardware, broadband, redundant power design, staffing plans and building renderings.
4. Market the facility to customers, US Government.

---

<sup>58</sup> <https://www.cnn.com/2017/08/15/worlds-largest-data-center-to-be-built-in-arctic-circle.html>

<sup>59</sup> <https://www.theverge.com/2016/9/29/13103982/facebook-arctic-data-center-sweden-photos>

<sup>60</sup> <https://spectrum.ieee.org/energywise/telecom/internet/iceland-data-center-paradise>

<sup>61</sup> <https://telepost.gl/en>

<sup>62</sup> <https://www.365datacenters.com/portfolio-items/data-center-colocation-build-vs-buy/>

#### 4.4 IMPLEMENTATION STRATEGY

Coordinating and implementing the actions outlined in this CEDS depends on a number of factors:

1. **Partnerships:** Responsible parties have been identified in each action, however we will need to formalize and strategize each task agreed on to establish ownership and responsibilities.
2. **Funding Availability:** Grant cycles rotate yearly for example and are mainly available to the NVB and NSB. Raising venture capital can be easy or difficult, depending on the availability of funds. We hope the EDA will help raise or match capital funds raised.
3. **Workforce Development:** We want to be able to retain and create local jobs, but we cannot do this without identifying or training an appropriate workforce. The NVB Workforce Development department and Iļisaġvik College will need to be up to the task, with sufficient lead time to do the job.
4. **Infrastructure Development:** We also need to identify assets such as land, which for example is primarily in the purview of UIC. Redevelopment projects depend on who own the land, with some opportunities for Brownfields grants filled in. There are a number of fractionated lands and even abandoned lots in Barrow which need to be identified and pursued for such purposes.
5. **Marketing and Sales:** Identifying customers who will use the new services and pursuing those customer markets is just as important as standing up the new operations and initiatives themselves. The tourism industry, for example needs a coordinated marketing campaign.

In determining the timelines themselves, we considered the driving factors above in combination with the priority set by the community. For example addressing the Housing Crisis is the number one in our list, as it received the highest combined score of Concerns, Opportunities, Threats and Big Ideas. Otherwise larger projects which are central to each Goal have been spaced out throughout the 5 years, with 2 large and 2 medium or smaller projects being pursued per year.

Certain goals were given a broad span of time, as can be seen in the "Repository of Business Opportunities" to give time for small business owners to be found and for these projects to ramp up.

Table 3: CEDS 2018-2023 Proposed Project Prioritization Timeline.

Task	Lead	Cost (min shown)	Timeline					
			2018	2019	2020	2021	2022	2023
<b>GOAL 1: FOSTER A DIVERSITY OF SAFE &amp; AFFORDABLE HOUSING</b>								
Objective 1.1: Create Barrow Housing Master Plan	NVB	\$ 100,000						
Objective 1.2: Create New Low and Very-Low Income Housing	NVB	\$ 330,000						
Objective 1.3: Create Homeless Shelter	NSB	\$ 500,000						
Objective 1.4: Create Family Homes and Apartments for Skilled Workers	ASRC	\$ 6,000,000						
Objective 1.5: What does a Modern Alaskan Home in the Arctic Look Like?	NVB	\$ 1,000,000						
<b>GOAL 2: CREATE NEW ROADS AND ROAD CONSTRUCTION METHODS</b>								
Objective 2.1: Planning a Permanent Road to Atqasuk	NVB	\$ 1,000,000						
Objective 2.2: Complete the Uivaqsaagiak Road (BARC Road)	NVB	\$ 2,000,000						
Objective 2.3: Research and Develop New Methods for Building Arctic Roads	NVB	\$ 3,000,000						
Objective 2.4: Barrow Walkway and Sidewalks Project	NVB	\$ 6,000,000						
<b>GOAL 3: PROMOTE AND EXPLORE NEW BUSINESS DEVELOPMENT</b>								
Objective 3.1: Barrow Economic Development Corporation	NVB	\$ 250,000						
Objective 3.2: Repository of Business Opportunities								
Concept 3.2.1: Barrow Shopping Mall	UIC	\$ 30,000,000						
Concept 3.2.2: Movie Theater	ASRC	\$ 1,000,000						
Concept 3.2.3: Cozy Coffee Shop	PRVT	\$ 200,000						
Concept 3.2.4: Conference Center	ASRC	\$ 20,000,000						
Concept 3.2.5: Nice Restaurant with Iñupiat Cuisine	PRVT	\$ 1,500,000						
Concept 3.2.6: Recycling Station	PRVT	\$ 250,000						
Concept 3.2.7: Hydroponic Farm Business	NVB	\$ 500,000						
Concept 3.2.8: Seafood Industry	AEWC	\$ 5,000,000						
Concept 3.2.9: Child Care and Day Care Centers	PRVT	\$ 500,000						
Concept 3.2.10: Substance Abuse Center and Jail	NVB	\$ 20,000,000						
<b>GOAL 4: EDUCATIONAL PROGRAMS FOR SUBSISTENCE AND INDUSTRY</b>								
Objective 4.1: Build New Campus for Iñisaġvik College	IC	\$ 175,000,000						
Objective 4.2: Reindeer Herding Revitalization Project	NVB	\$ 2,000,000						
<b>GOAL 5: GROW THE TOURISM INDUSTRY IN BARROW</b>								
Objective 5.1: Visit Barrow: Eco-Tourism Center	NVB	\$ 10,000,000						
<b>GOAL 6: ARCTIC MARITIME LOGISTICS STUDY</b>								
Objective 6.1: Planning for The Barrow Deep Sea Port	NSB	\$ 5,000,000						
<b>GOAL 7: INVEST IN ALTERNATIVE FUELS AND ENERGY</b>								
Objective 7.1: Investments in Compressed Natural Gas (CNG)	NVB	\$ 5,000,000						
Objective 7.2: Prototype Wind and Solar	IC	\$ 500,000						
<b>GOAL 8: BROADBAND INFRASTRUCTURE INVESTMENTS</b>								
Objective 8.1: Microwave Internet Backhaul Network	NVB	\$ 40,000,000						
Objective 8.2: Barrow Datacenter: "US Arctic Data Fortress"	ASRC	\$ 20,000,000						

## 5. EVALUATION FRAMEWORK

To avoid duplication, the Evaluation Criteria have been incorporated into each Goal and Objective in Section 3 of this document. In general terms, we measure the performance and impact of the task by:

### Evaluation Criteria:

1. Confirming the critical steps towards achieving the objective have been completed.
2. Confirming that grant applications, capital and project funding is pursued or secured.
3. Measuring distinct metrics, such as:
  - a. Economic Activity: revenue generation, grants secured, cost savings, funds kept within the village, new business creation, new business facilitation endeavors, new revenue streams secured, etc
  - b. Environmental Impacts: hazard mitigation, deployment of alternative energy technologies, ecological impact monitoring programs
  - c. Social Impacts: workforce trained, new educational courses created, number of students enrolled, entertainment options created, subsistence jobs, ie "subsistence as a profession" job creation, etc
  - d. Communication Channels: agreements, MOU/MOAs created, ordinances, information networks, websites, etc.

### Resource Allocation:

In determining the best way to use resources, we have used each stakeholder organizations strengths and assets, while distributing load where possible.

- **NVB:** As the NVB will be leading the deployment of the CEDS, we take a program oversight approach to objectives with many dependencies or cross-cutting applications. We also leverage the federal funding capabilities of the Tribal Government where possible, and the NSB municipal funding and program budgeting powers where appropriate.
- **ASRC:** As the most successful regional corporation in Alaska, ASRC has access to discretionary capital and the good will to invest in local businesses and infrastructure, especially for Native owned businesses, likely also an ASRC shareholder.
- **UIC:** As the majority landowner in Barrow, UIC plays the most essential role in allocating land and buildings for new developments, new construction and repurposing. In 1992 UIC allocated almost 250 homesite lots to shareholders for new home construction and owns the gravel mine which is essential to road and infrastructure development projects.
- **Iḷisaḡvik College:** A prolific institution always adapting to meet the needs of Barrow's changing workforce, the college works closely with the NVB, ASRC and UIC to determine workforce needs.

## 6. ECONOMIC RESILIENCE

### 6.1 Planning and Implementing Economic Resilience

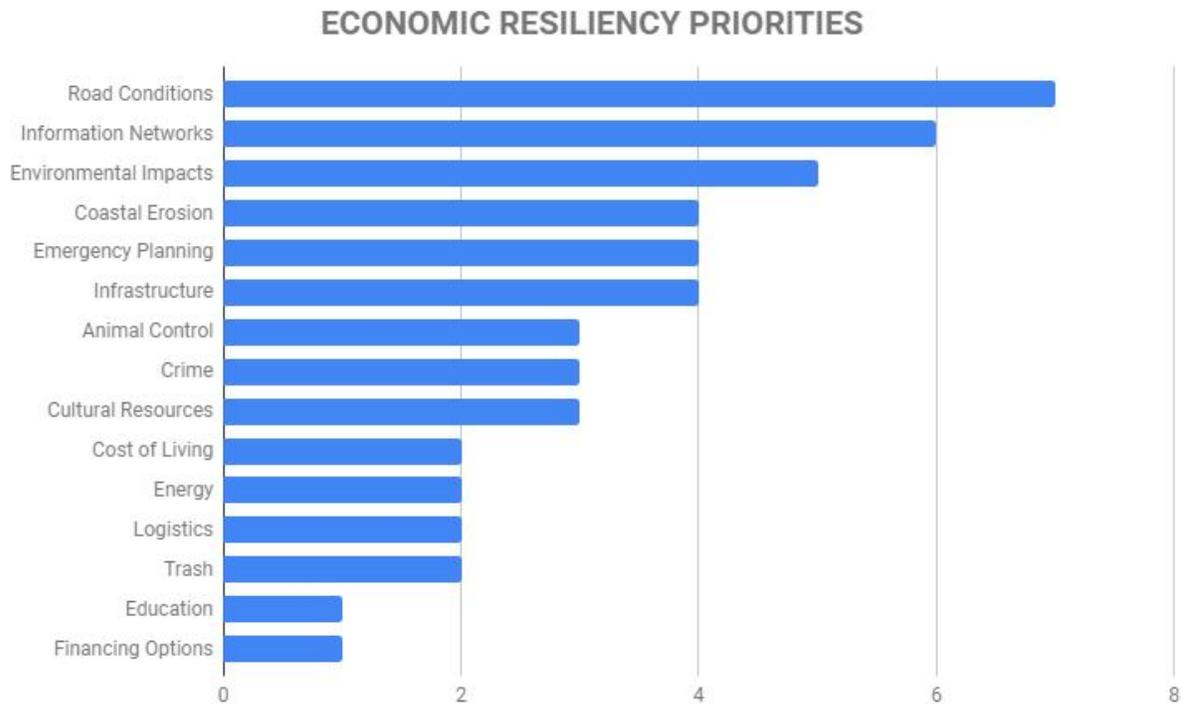


Image 33: 52 unique responses collected, 95% of which are represented here in this chart.

**Economic resilience** is the ability to withstand and recover quickly from a disruption to the economic base. Image 7 shows the priorities described by the community as critical needs.

The Goals and Objectives set in this CEDS were weighted against these priorities and addressed as follows:

#### 1. Road Conditions:

- Dust Control
- Road Conditions
- Evacuation Routes, Road out of Barrow
- BARC Road

**RESPONSE:** Addressed throughout the objectives set out in "Goal 2: Create New Road and Road Construction Methods."

## 2. Emergency Planning / Information Networks:

- Centralized Arctic-Based Library
- Citizen Emergency Response Teams (CERT)
- Collaboration during times of crisis
- Collaboration with external entities
- Elders knowledge to combat natural disasters
- Emergency Evacuation and Response Plan
- Emergency response reservoir
- No evacuation plan if the ocean rises from tsunami
- Personal disaster preparedness kits
- Responsiveness to disease (COVID-19 pandemic related)

**RESPONSE:** Develop NVB version to Barrow-wide FEMA emergency plan, and incorporate with NSB and State of Alaska FEMA plans to address emergency responses to threats as listed, including the current covid-19 pandemic.

### **ACTIONS:**

- The NSB Risk Management Department has an extensive list of Hazard Mitigation Plans<sup>63</sup> following FEMA guidelines and updated in 2015. Proliferation of these plans throughout stakeholders, CEDS partners and local businesses will bring awareness and nurture cooperation in times of crisis. (Lead: NSB Risk Management)

## 3. Environmental Impacts:

- Military diesel drum removals
- Permafrost melting
- Risk of contaminated groundwater directly led to ocean
- Storm swells

### **ACTIONS:**

- 3.1 Coordinate concerns with EPA representatives and seek an action plan for their resolution. (Lead: NSB)
- 3.2 Pursue EPA Brownfields Grants to remove hazards and redevelop lands. A comprehensive mapping of contaminated sites in Barrow is needed to best address this problem (lead: NVB, NSB)
- 3.3 Maintain NSB shoreline protection efforts, seek additional funding towards permanent solutions, eg. by commissioning a Water Engineering study throughout Barrow. (Lead NSB)

---

<sup>63</sup> <http://www.north-slope.org/departments/administration-finance/risk-management>

#### 4. Coastal Erosion:

- Coastal Erosion
- Coastal Erosion and flooding
- Historical sites at risk of erosion

**NOTE:** The EPA and Army Corps of Engineers recently (2017) updated measurements of coastal erosion along Barrow and has presented preliminary plans for revetment wall. The plan involved the use of sheet pile, which are large metallic sheets driven into the coastline. This approach failed when used on the Port of Anchorage<sup>64</sup> and was rejected by the NSB and the local community and Rock Armor was requested, which has been used successfully in Wainwright. We will monitor progress as these agencies are working towards resolution of this critical concern.

#### 5. Infrastructure:

- Buildings subsiding
- campus reconfiguration
- Gravel pits needed
- lack of space

**RESPONSE:** Addressed through "*Goal 1: Foster a Diversity of Safe & Affordable Housing*", "*Goal 2: Create New Roads and Road Construction Methods*" and "*Objective 4.1: Build New Campus for Iñisaġvik College*".

#### 6. Crime:

- Active shooter training
- Drug use/abuse, meth
- Health, Suicide, Drug Abuse

**RESPONSE:** Addressed through "*Concept 3.2.10 Substance Abuse Center and Jail*".

#### 7. Cultural Resources:

- Fishing and Fish Camp facilities
- Hunting traditions
- Subsistence resilience and food security

**RESPONSE:** Addressed through "*Goal 5: Grow the Tourism Industry in Barrow*", "*Objective 4.2: Reindeer Herding Revitalization Project*" and "*Concept 3.2.8: Seafood Industry*" and generally the creation of "Subsistence as a Profession" employment opportunities.

---

<sup>64</sup> [ADN, Anchorage's port is falling apart. With the clock ticking, who will pay to fix it? \(Aug 15, 2017\)](#)

**8. Energy:**

- alternate energy sources
- Dependence on 1 source of energy when there are many

**RESPONSE:** Addressed through "*Goal 7: Invest in Alternative Fuels and Energy*"

**9. Logistics:**

- maritime traffic
- no port

**RESPONSE:** Addressed through "*Goal 6, Objective 6.1: Planning for The Barrow Deep Sea Port*"

**10. Trash:**

- Abandoned Vehicle Removal
- City wide cleanup

**RESPONSE:** Addressed through "*Concept 3.2.6: Recycling Station*"

**11. Education:**

- not enough people in higher education

**RESPONSE:** Addressed throughout the CEDS with emphasis on creating new courses, increasing enrollment and training new workforce with the help of Iḷisaḡvik College.

## **6.2 Establishing Information Networks**

As described in "*Objective 3.1: Barrow Economic Development Corporation*", the BEDC will communicate and coordinate emergency economic response actions, acting as the central "Business Information Network" or "Business Emergency Operations Center".

Hazard mitigation planning, communications and execution will be led by NSB Risk Management Department.

## APPENDIX A. CEDS COMMITTEE ROSTER

	<b>Organization</b>	<b>Name</b>	<b>Position</b>
1	Native Village of Barrow	Andreas Tziolas	CEDS Project Manager
2	Native Village of Barrow	Charles Brower	Acting Executive Director
3	Native Village of Barrow	Sam Okakok	Housing Director
4	Native Village of Barrow	Mary Jane Lang	Grants Administrator
5	North Slope Borough	Matthew Dunn	Deputy Director Planning Department
6	North Slope Borough	Muriel Brower	Community Development Planner
7	North Slope Borough	Lars Nelson	Deputy Housing Director
8	North Slope Borough	Heather Seemann	Director Risk Management
9	UIC	Delbert Rexford	CEO
10	UIC	Nagruk Harcharek	Director UIC Lands
11	UIC	Erika Green	Senior Planner, UMIAQ
12	UIC	Vernon Edwardson	General Manager, UIC Real Estate
13	ASRC	Richard Reich	GM Community Economic Development
14	Alaska Growth Capital	Aurora Warrior	Consulting Associate
15	Ilisagvik College	Diana S. Solenberger	Director of Community Engagement
16	City of Utqiagvik	Fannie Suvlu	Mayor
17	Family Tax Service	Michael Stotts	Small Business Owner
18	Lowery Electric	Billy Lowery	Small Business Owner
19	Barrow Mechanical	Richard Alred	Small Business Owner

## APPENDIX B. PUBLIC COMMENTS

Public comments collected during the public review and comment period August 20 - September 20, 2018, were transmitted to the CEDS Project Manager and copied here in whole. Comments relevant to the SWOT analysis were folded into our analysis.

1. Section 2 should just be graphs, so people can scan information quickly.

Removed tables and text and redesigned this section to be more pleasing and shorter.

2. Section 3 - SWOT analysis could use some intro text. It jumps immediately into talking about respondents with no introduction as to what's going on. What was the survey about and why? Needs motivation at the beginning.

Introductory texts added throughout the document with explanations of what the point of that section is.

3. Image 1 - 5, why are you representing 81% and 82% of the responses in the chart? Why not 100%?

Removed the statistic and replaced the text explaining that entries were grouped together by theme.

4. p15 Goal 1 " Cost Estimate: \$500,000 - \$5,000,000 " wide range. Factor of 10.

Added text explaining \$500k is for remodeling an existing property and \$5M is for new development.

5. p16 " There is a competent availability of jobs" what does a competent availability mean?

Changed "competent" to "reasonable availability of jobs".

6. p23 "representing opportunities for diversifying the economy" how about 'broadening the economy". Overused term. What does it really mean?

Change made as suggested.

7. Section 4.4 - Could use a few words describing the motivation for that section before jumping into the timeline chart.

Added section describing what affects the timeline and how this timeline was put into place.

8. Section 2 Summary Information - These sections are way too long and in my opinion are duplicated in the NSB comprehensive plan and UIC master plans. For economic development it will be better if the sections are short and easy to read.

Reduced size of Section 2 and limited information to one page, graphics and maps.

## **APPENDIX C. SWOT MEETINGS DETAIL RESPONSES**

The raw data is available [here](#).

**APPENDIX D. NVB RESOLUTION ADOPTING CEDS 2018**