Transport Issues for Development Projects in Alaska's Rural Communities

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Denali Commission

Present cargo transport methods

http://www.nacargo.com/about/history.php

Need for Cargo Airships

- Weight
  - Open water transport
  - Seasonal Ice roads
- Volume
  - Cargo door width
  - Cargo length
- Seasonal needs
  - Development limited by access and supply
- Demonstrate cost effective formula
  - Weight x volume x operating expense < conventional

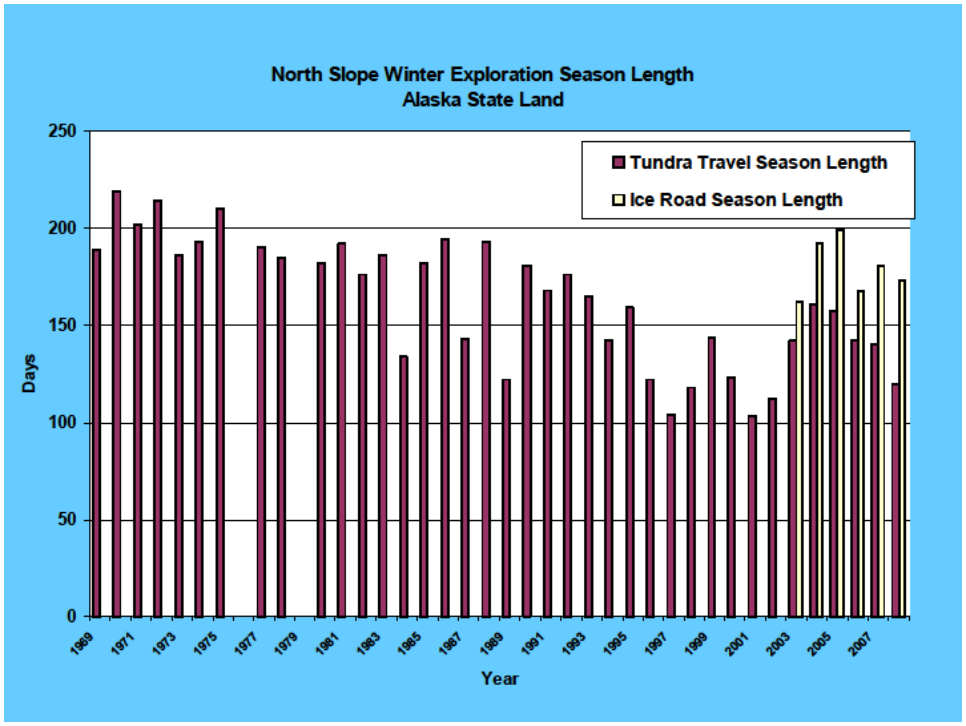
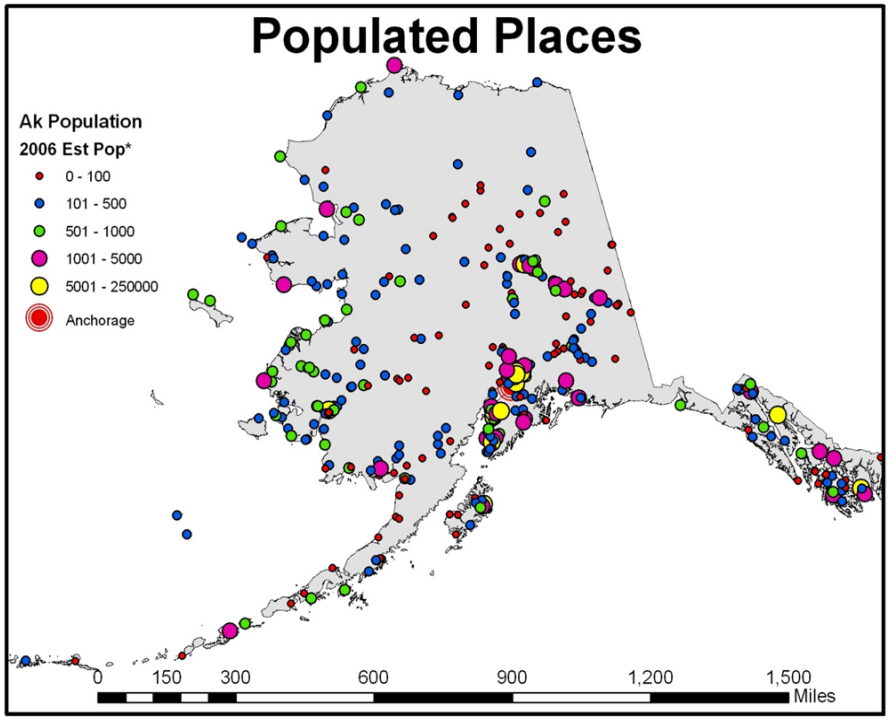
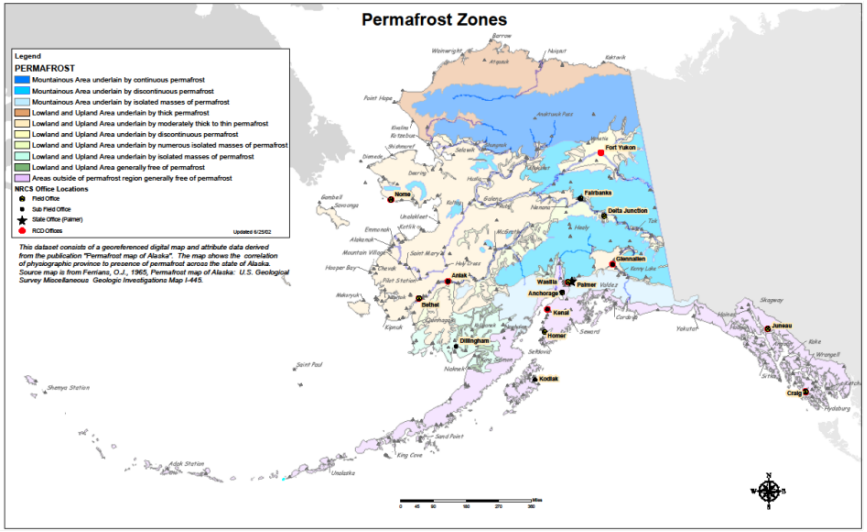


Figure from Alaska Department of Natural Resources – Gary Schultz

Challenges

- Small communities
- Short air strips
- Seasonal limitations
  - Water
  - Ice
- Truncated construction season
  - Thaw
  - Break-up
  - River navigation





ANCSA Native Corporations

- ANCSA created
  - 13 Regional Corporations
  - > 200 Village Corporations
- Corporations
  - Major land owners
  - Success in resource development
  - Protection of traditional use
  - Important partners in ventures, e.g. Red Dog Mine

From Alaska DNR, Division of Mining, Land & Water

Housing

- CCHRC model
  - One airplane load
  - Designed by community
    - Charette process
  - Constructed on site
  - Efficiency in
    - Multiple structures
    - Water and sanitation systems

Photos from Cold Climate Housing Research Center

Village Relocation

- Newtok to Mertavik
  - IRT project
  - State of Alaska investment
  - Newtok Planning Group
- Mertarvik
  - Camp
  - Pioneer Roads
  - Barge Landing
  - Staging areas

Seafood

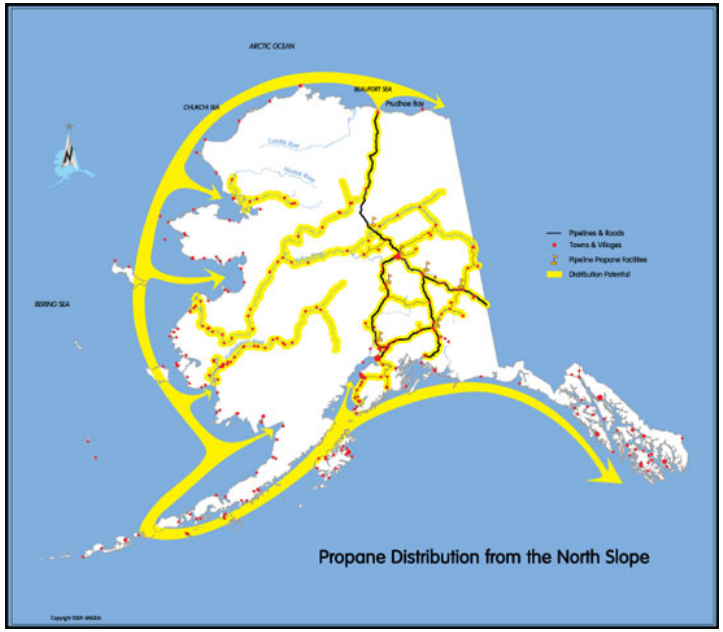
- Volume & Time
  - One step in supply chain
    - Landing to shipping point
  - Quality of market delivery
    - Time & volume versus perishable of fresh
  - Options for live transport
  - Special operations - hatchery
- Seasonal flexibility
  - Follow fishery
  - Movement of specialized equipment

Photos by AQUALIFE http://aqualife.nu/picture-gallery.html

Energy

- Fuel distribution
  - Petroleum
    - Tug and barge
    - Aircraft
  - Propane
    - Proposed river distribution for rural villages
    - Accepted fuel supply
    - Yukon Kuskokwim Propane Demonstration Project
    - Winter Route Study

Photo by Crowley



From ANGDA, 2009

Rural Power System Upgrades

- Integrated Power Plant
  - On-site construction
  - Tanks co-located
  - Accessible by barge
  - Fixed site
- Modular power plant
  - Constructed off site
  - Delivered to community
  - Modular enables future movement

Photos courtesy of AEA and Denali Commission

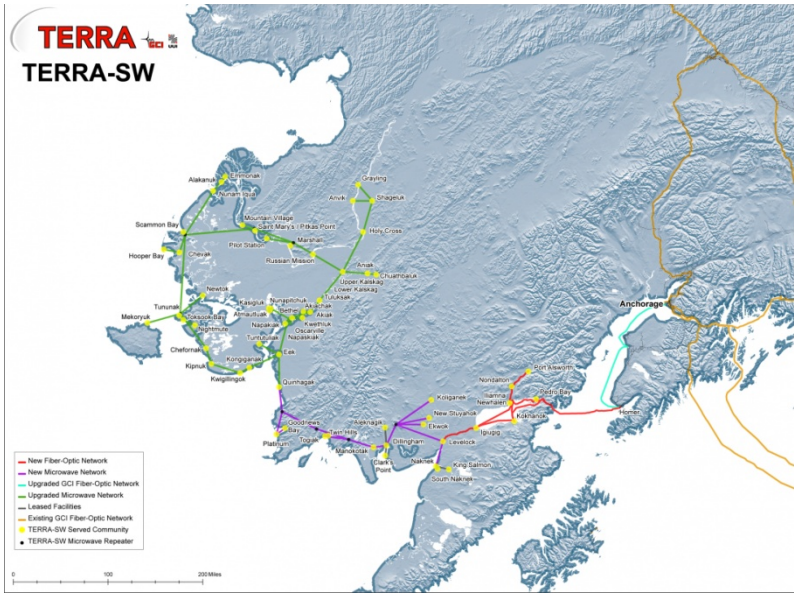
Wind Turbines

- Combined package
  - Foundations
    - Castings
    - Thermosiphons
    - Pilings
  - Towers
  - Turbines
  - Wind-diesel control station
  - Intertie

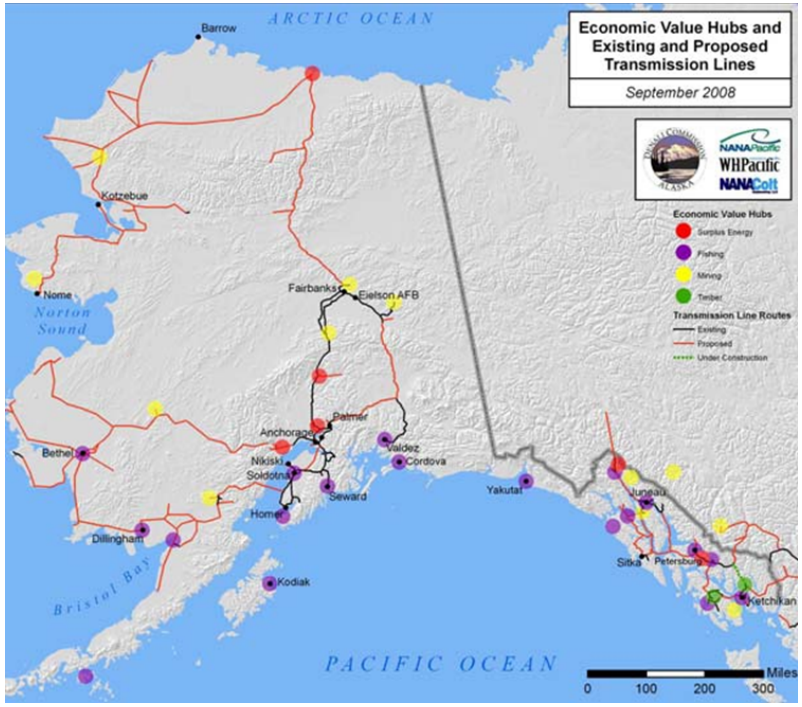
Photos courtesy of AVEC and Denali Commission

Transmission Lines and Networks

- Broadband Microwave
  - GCI Terra SW example
    - Towers
    - Power systems
- Electricity Transmission
  - AVEC & AEA
    - Transmission routes
    - HVDC studies



Map from GCI TERRA-SW



Map from Denali Commission Rural Transmission Study

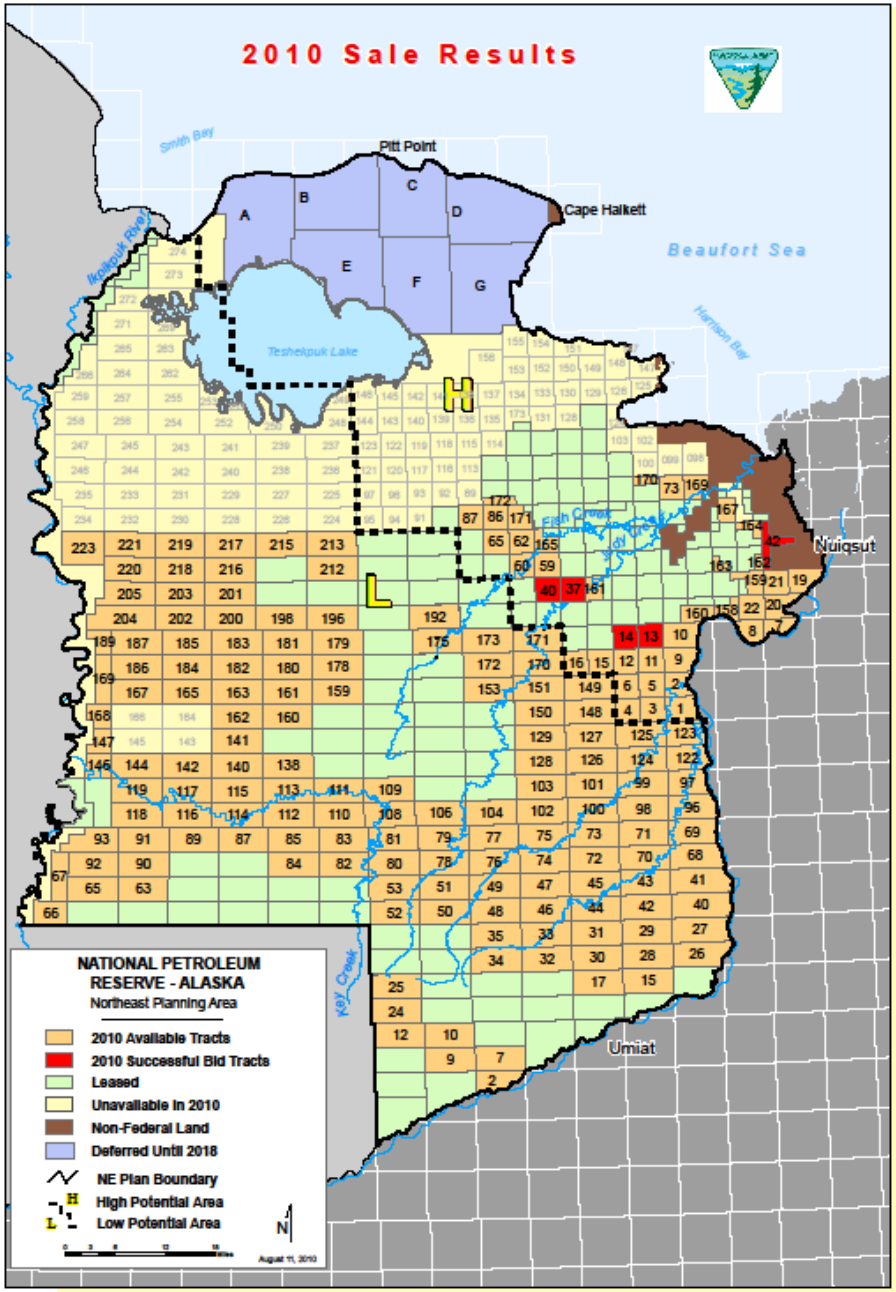
Resource Development- Mining

- Donlin Creek Mine
  - 100 days water access on Kuskokwim River
  - 10 miles from Crooked Creek

Resource Development – Oil and Gas

- North slope developed infrastructure
- Ice Road dependent for <200 days/yr
- Foot print size has decreased at new sites

NPRA



http://www.blm.gov/pgdata/etc/medialib/blm/ak/aktest/energy/2010_npr-a_lease_sale_maps.Par.76712.File.pdf/2010_FINAL_LEASE_RESULTS.pdf

Marine Incident Response

- Surge into small coastal communities
  - Limited support capacity
    - Housing and supplies
    - Water and Sanitation
    - Energy and power generation
    - Communications

- Staging and handling of response equipment
  - Incident Command Actions
    - Vessel
    - Response equipment
    - Salvage
    - Waste removal

Photos: Alaska DEC, USCG & Tim Roberts, Nuka Research

Wainwright AK – Chukchi Sea

Innovation

- M/V Susitna
  - Ice class vessel
  - SWATH technology
  - Hydraulic Deck
- Lightweight Modular Causeway System
  - Flexible
  - Deployable
  - Remote Operations

Photo by Charley Starr

JBER 3rd Wing Public Affairs

Alaska Purpose Built

- Crowley Maritime
  - Shallow water tug
  - Double hull barge
- Edison Chouest Offshore
  - Deadhorse Hanger
  - Arctic Offshore Support Vessel

Photo courtesy of Crowley Maritime

Photo courtesy of Edison Chouest Offshore

Summary

- Opportunities in rural Alaska challenges
  - Modules favoring volume over weight
  - Specialized construction materials
  - Live product handling
  - Point to Point delivery
- Innovation can work
  - Purpose built
  - Flexibility in serving multiple purposes