



Alaska Department of Transportation & Public Facilities

Alaska Aviation System

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August 24, 2011



Alaska Scope and Scale

- Most northern, eastern and western points of the US
- 17 tallest N. American peaks are in AK
- Juneau accessible only by plane or boat
- 27 active volcanoes
- 13 of the largest US earthquakes were in AK
- Harding Ice Field bigger than Rhode Island
- 52 million acres of parkland
- The 2 largest National Forests are in AK
- AK/Canadian Border is the longest shared border
- 3,000 rivers, 100,000 glaciers
- 44,000 miles of coastline



Alaska DOT & PF Mission

To provide for the safe **and efficient movement of people and goods**

To provide access to state services

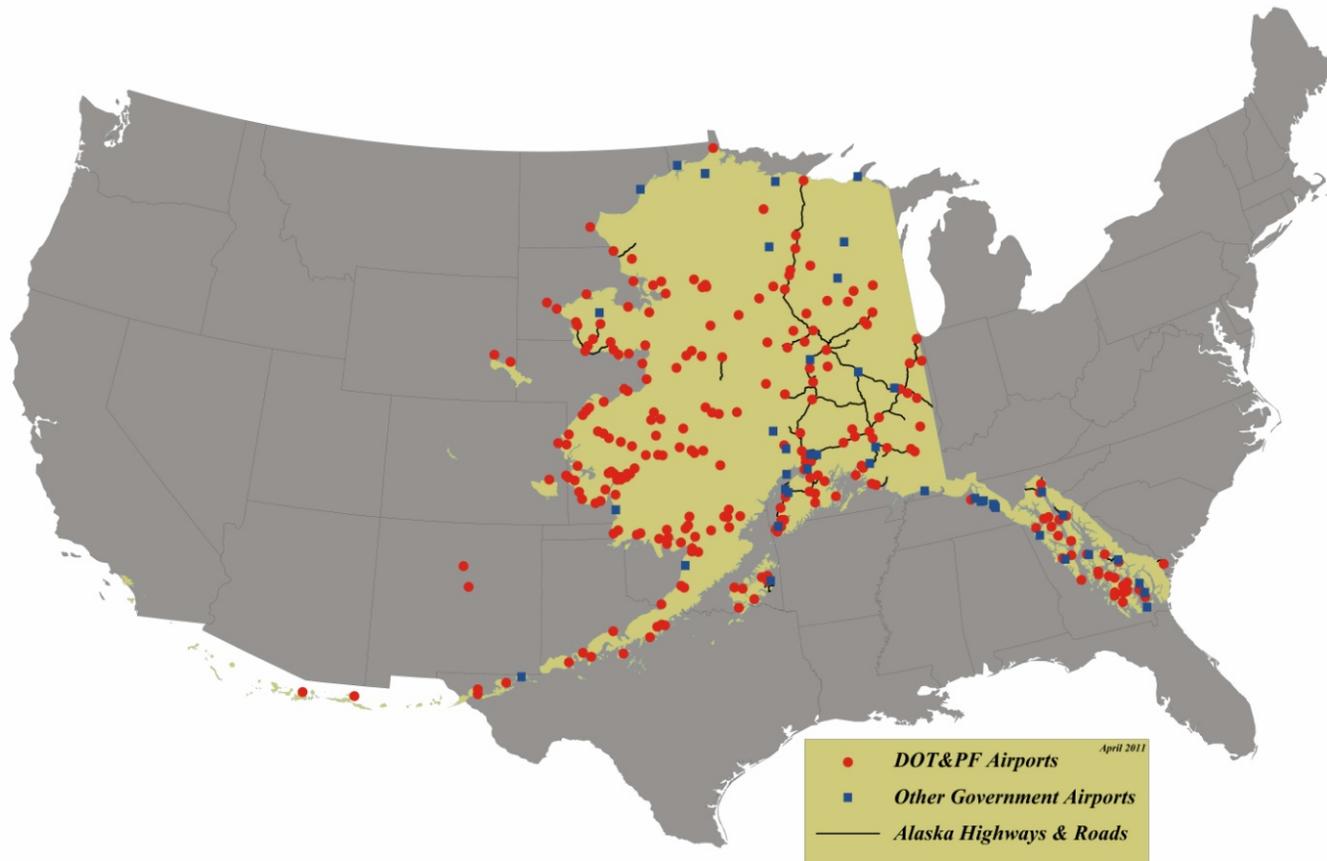
To open opportunities for exploration and development of Alaska's resources



Alaska Aviation System

Largest Aviation System in North America

Alaska DOT&PF Largest Sponsor of Airports in United States
254 Total Airports Includes 2 International Airports





Community Lifeline/Economic Engine

- **82% of Alaska's communities not connected to road system**
- **Airports provide a vital link for access to food, mail, schools, health care services and travel**
- **3.5 billion to the State economy**
- **47,000 jobs represents 10% of all jobs in Alaska**
- **16X Aircraft/Capita**
- **6X pilots/Capita**





Alaska Aviation Mix

Aviation Mix

- Jet engine
- Piston engine
- AIAS to back country
- Mountain passes
- Tourism
- Heavy GA activity

Airspace De-confliction:

- Anchorage airspace
- Military airspace (special use)
- Hub airspace (Bethel)
- Uncontrolled airspace



Alaska Operating Environment

- Time/Distance
- Dark/Light
- Temperature extremes
- Earthquake
- Volcano
- Wind
- Flood
- Sea Rise
- Permafrost/Thaw
- Wildlife



Tuntutuliak – Linking Airport to Community



Tuntutuliak Board Walk



Airport M&O Challenges



Spring Challenges





Annual Flooding



Flood – Except at the Airport!



Rural Airport Capitol Projects

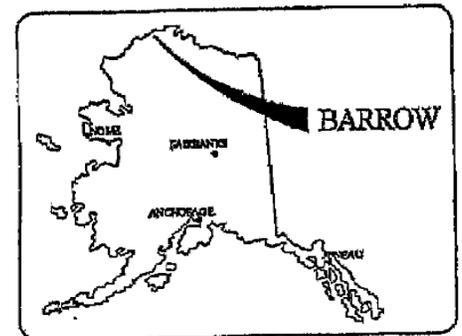
- Expensive to construct runways in rural Alaska
- Equipment, labor, material and supplies must be barged or flown in
- Gravel \$600/cubic yard;
- Heavy equipment & machinery – stranded capital
- Intensive logistics, planning & dispatch window



Arctic Airport Construction Barrow Airport Improvement Project

BARROW
JULY 25TH & 27TH, 2010

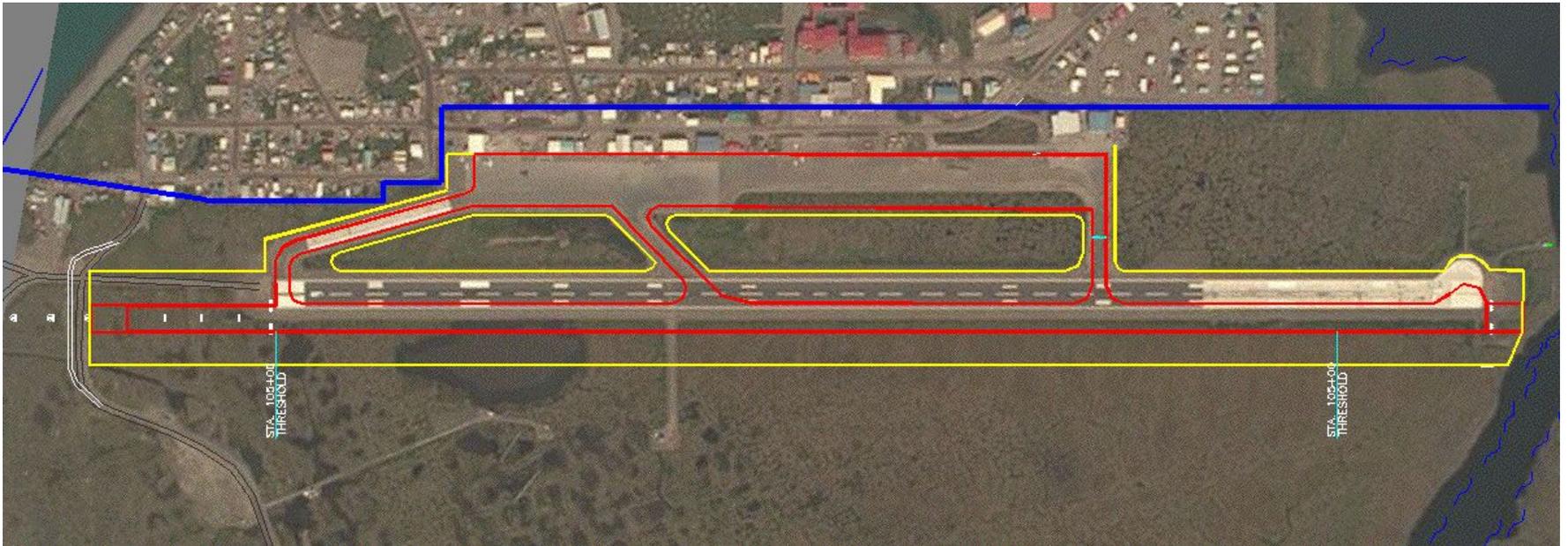
Native Village of Barrow



Barrow: Early July



Project Scope



- **Move Runway 210' south and construct 500' X 8500' Safety Area**
- **Pave runway, taxiways, apron areas**
- **Install new Navigation-Aids**

Material Source

- Perma-Frost
- Mostly very fine material
- Ice lenses and high water content material common



Logistics Challenges

- No roads to Barrow - everything arrives by airplane or barge
- Short construction season - snow possible anytime during summer



Fine Material Causes Erosion Problems



Shipping Challenges

- **Equipment and asphalt oil must be barged into Barrow**
- **Barges arrive once a year in early August - weather delays are common**



Getting Gravel to an Airport

Process Flow for Gravel

- Off load gravel from barge to;
- Smaller tender;
- Shore landing;
- Over tundra to site (permit required);
- Stockpile;
- Stranded capital?



If It Can't be Barged

- Fly it out
- Fly in the fuel
- Spare parts
- Fly it back, or
- Stranded asset



Asphalt Oil Challenges

- **Asphalt oil must be ordered a year or two in advance**
- **Additional storage tanks required, due to long turn around time**





Weather Issues

- **Unexpected changes in summer weather can cause long delays**



May 31, 2009

Fuel Delivery

- In 82% of villages if it can't be barged in, it must be flown in
- Lower river levels can make this difficult
- Winter ice prohibits this type of delivery
- Occasionally villages run out of fuel during the winter



Water Problems

- Water from saturated tundra flows into excavations





High Costs of Arctic Construction Projects

- **Additional mobilization / demobilization costs**
- **Higher labor costs**
- **Problems hiring skilled personnel**
- **Material extraction is expensive**
- **Field office overhead high**
- **Barge and air freight costs**
- **High cost of flying personnel to project**
- **High cost of living in Barrow**
- **Short summer season extends project life and costs**
- **Need for some winter work to avoid tundra degradation**



Beyond Transportation Infrastructure

Rural / Remote Health Care:

- **Routine / Preventative**
- **Diagnostic**
- **Dental / Vision**
- **Pediatric / Geriatric**
- **Emergency**



Other Challenges Working in the Arctic









Thank you!

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