



Alaska Department of Transportation & Public Facilities Resilience Innovations Summit and Exchange Building Resiliency in Your Infrastructure

Marc Luiken, Commissioner

October 9, 2018

Keep Alaska Moving through service and infrastructure

Identifying Risk to Infrastructure: Changing Climate

Alaska Climate Trend Vulnerability Study 2016

Identified 3 primary climate change related risks:

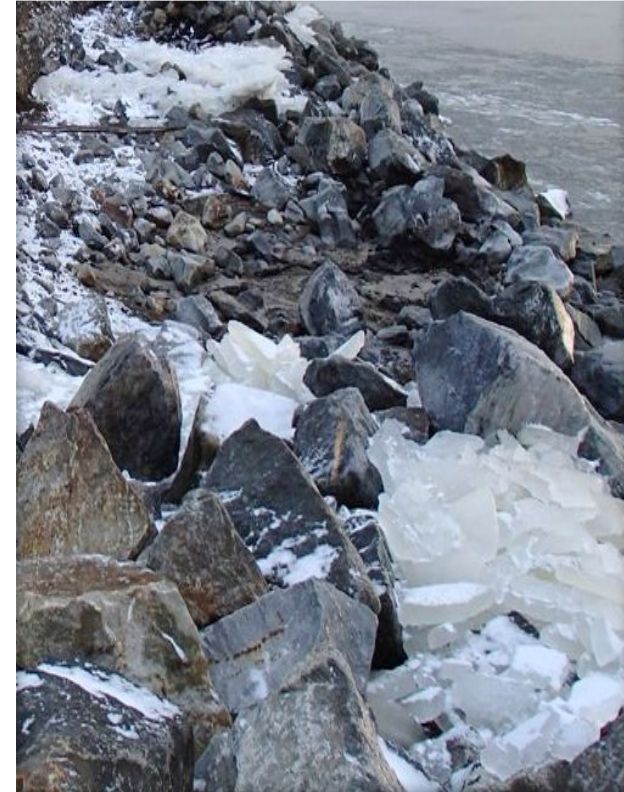
Increase in average
precipitation and extreme
weather events



Accelerated Permafrost
Thawing



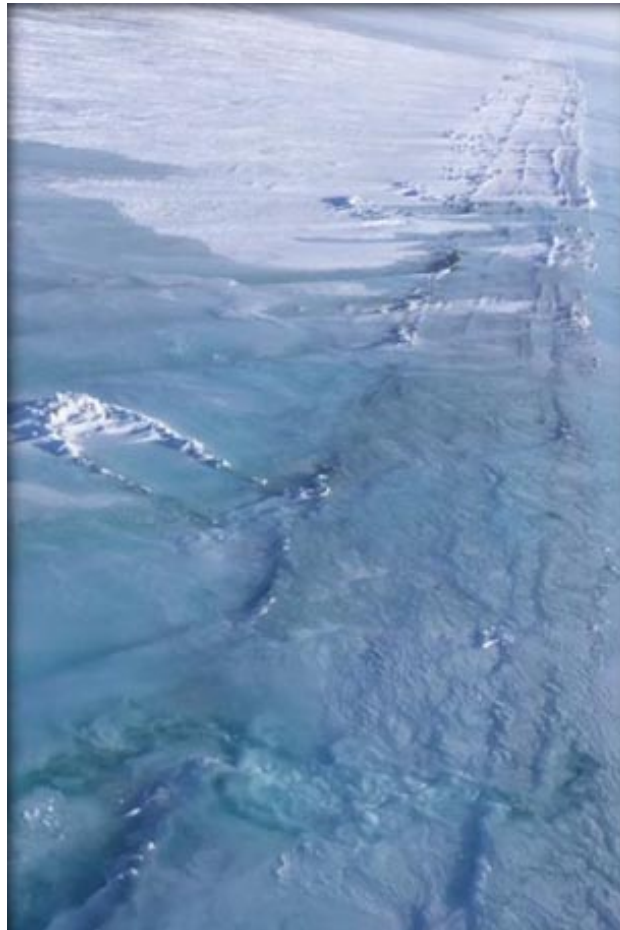
Reduced Sea Ice



Increase in Precipitation and Weather Events



Fairbanks Freezing Rain



Dalton Highway Aufeis/Flood



Sheep Mountain Airport Slide

Accelerated Permafrost



Evaluating permafrost degradation damage and thermokarst ponding at Noorvik Airport, September 2018.

Reduction in Sea Ice

Shishmaref Landfill Access Road



Nome Council Highway



Alaska's Response to Identified Risks

Refinement and training in emergency response

Adaptation in design

Development of more efficient and proactive maintenance techniques

Adaptation in Design



Foam Insulation – Dalton Highway, MP 9



ACE Rock – Alaska Highway MP 1354-1369



Thermosyphons – Deadhorse Maintenance Station Foundation

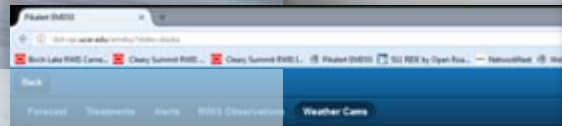
Efficient and proactive maintenance techniques



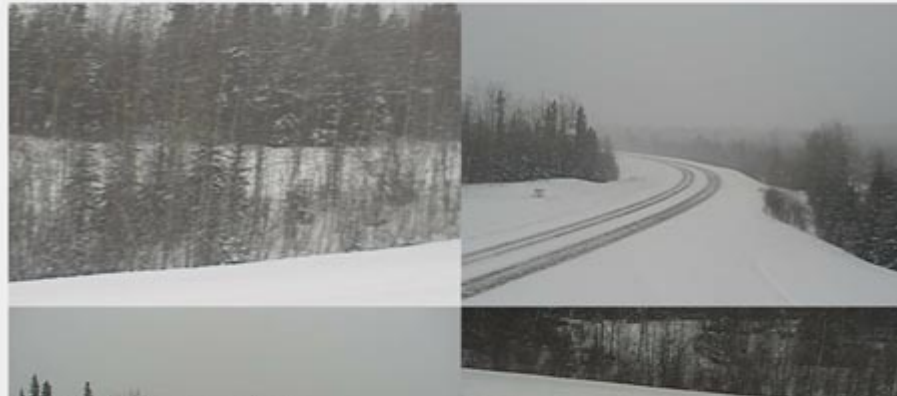
Fairbanks Ice Breaker



Brine Application



3/4 2:32 pm - Richardson Highway @ Birch Lake MP 307



Road Weather Information (RWIS) Stations

Case Study 1: Dalton Highway 2015 Flood Event

Fall 2014

**Heavy rain in the
Brooks Range**

Winter/Spring 2015

**Aufeis: Sag River frozen to the
bottom**

Water pushed to surface

**Crews from DOT&PF and
Alyeska work to keep overflow
from the Dalton Highway**

**Winter storm forces the road
closure, strands 800 – 1,000
trucks**

*“A perfect sequence of
snowfall, temperatures
and winds lined up to
create a massive sheet
of ice that expanded
for miles”*





Disaster Declaration

April 7, 2015



Unified Incident Command

Alaska DOT&PF

ConocoPhillips

BP

**Alyeska Pipeline
Service Company**

ExxonMobil

North Slope Borough



UIC begins April 10

Flood Event

May 17, 2015

Spring Breakup; major flooding closes highway for 2nd time



May 21, 2015

Flooding begins in Deadhorse; 2nd state disaster declaration

May 24-25, 2015

Water recedes dramatically in a day



Recovery Operations

May 25, 2015

Repair work begins

June 1, 2015, 8:00 a.m.

Road reopens



Case Study 2: Bridge-Apocalypse

March 21, 2018

Heavy haul truck with module aboard hit Bulb-T girder at ~ 65 – 70 mph



Shut down major artery into Anchorage – busiest road in the state

March 22, 2018

Detour through Eagle River caused 20 mile traffic jam

March 23, 2018

Alternate route opened around bridge



Case Study 2: Bridge-Apocalypse

Communication an all out effort

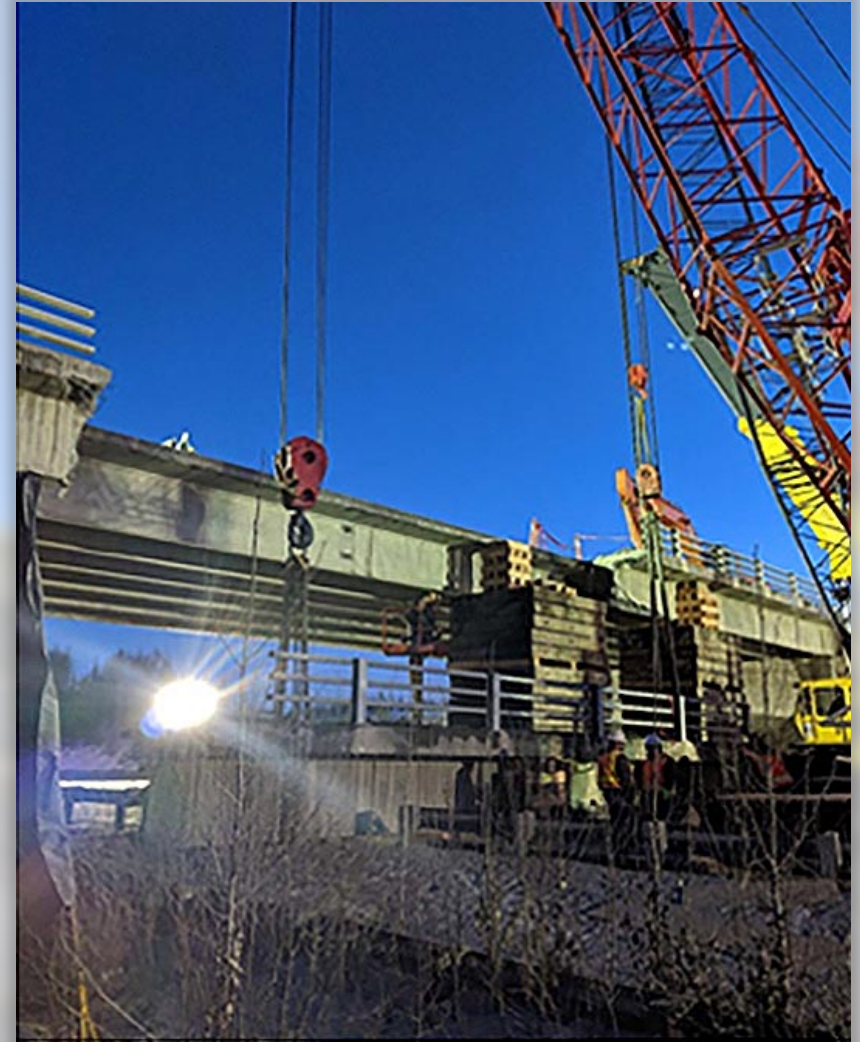
Governor visited site

**Great coordination with APD and
AST**

**Rapid contracting and contractor
support**

**Bridge repaired over the
weekend**

**Road opened for business on
Monday morning**



Lessons Learned / Implementation

Part of resilient infrastructure is how we handle and respond to an Emergency Event



Incident Command processes should be in place and key players identified

Emergency response performance; practice is essential

- Emergency management training ongoing throughout agency
- Department wide table top exercises.

Communication, communication, communication

Responsive procurement

**Partners
State
Federal
Contractors**

**Flexibility /
Adaptation in
design is critical to
project changes,
can produce
greater resilience**

**Design changes
improved
maintenance
efficiencies**



Thank You



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Richardson Highway Avalanche, January 2014. Photo by Alaska DOT&PF