Alaska Climate Change Strategy

PUBLIC INFRASTRUCTURE TECHNICAL WORKING GROUP

A SYSTEM TO REDUCE THE IMPACTS OF CLIMATE CHANGE ON ALASKA'S PUBLIC INFRASTRUCTURE

April 3, 2009 AAG Meeting

Today's Presentation

A. **Introduction to the PI TWG System**

B. **PI TWG Recommended State Action**

  ➢ **7 Actions, 3 of which are immediate next steps**

C. **Overview PI TWG Vision & Policies**

INTRODUCTION TO THE PI TWG APPROACH

April 3, 2009 AAG Meeting

Public Infrastructure

The essential facilities and utilities
under public, cooperative or private ownership
that deliver goods and services to communities.

Climate change in Alaska
creates the following potential impacts for public infrastructure (with significant regional variation):

- ➢ Increased flooding and erosion
- ➢ Decreased duration (cold season) and extent (warm season) of shore fast sea ice
- ➢ Increasing freeze/thaw cycles
- ➢ Changing wind and precipitation
- ➢ Increased storm frequencies and duration
- ➢ Warming and thawing permafrost
- ➢ Increased fire risk

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KEY DESIGN FEATURE:
IT IS AN INTEGRATED SYSTEM

A Vision & 3 Integrated Policies - That Together Create a System

Policy	Title
Vision	Sustainable Infrastructure that supports Communities in an Uncertain Environment
PI-1	Create a Statewide System for Key Data Collection, Analysis, Monitoring and Access
PI-2	Promote "No Regrets" Improvements
PI-3	Build to Last. Build Resiliency into Alaska Public infrastructure.

Sustainable Infrastructure that supports communities in an uncertain environment

Performance Feedback

Integrated coordinated decision making

Build to Last

Promote "No Regrets" Improvements

Create a Statewide System for Key Data Collection, Analysis, Monitoring & Access
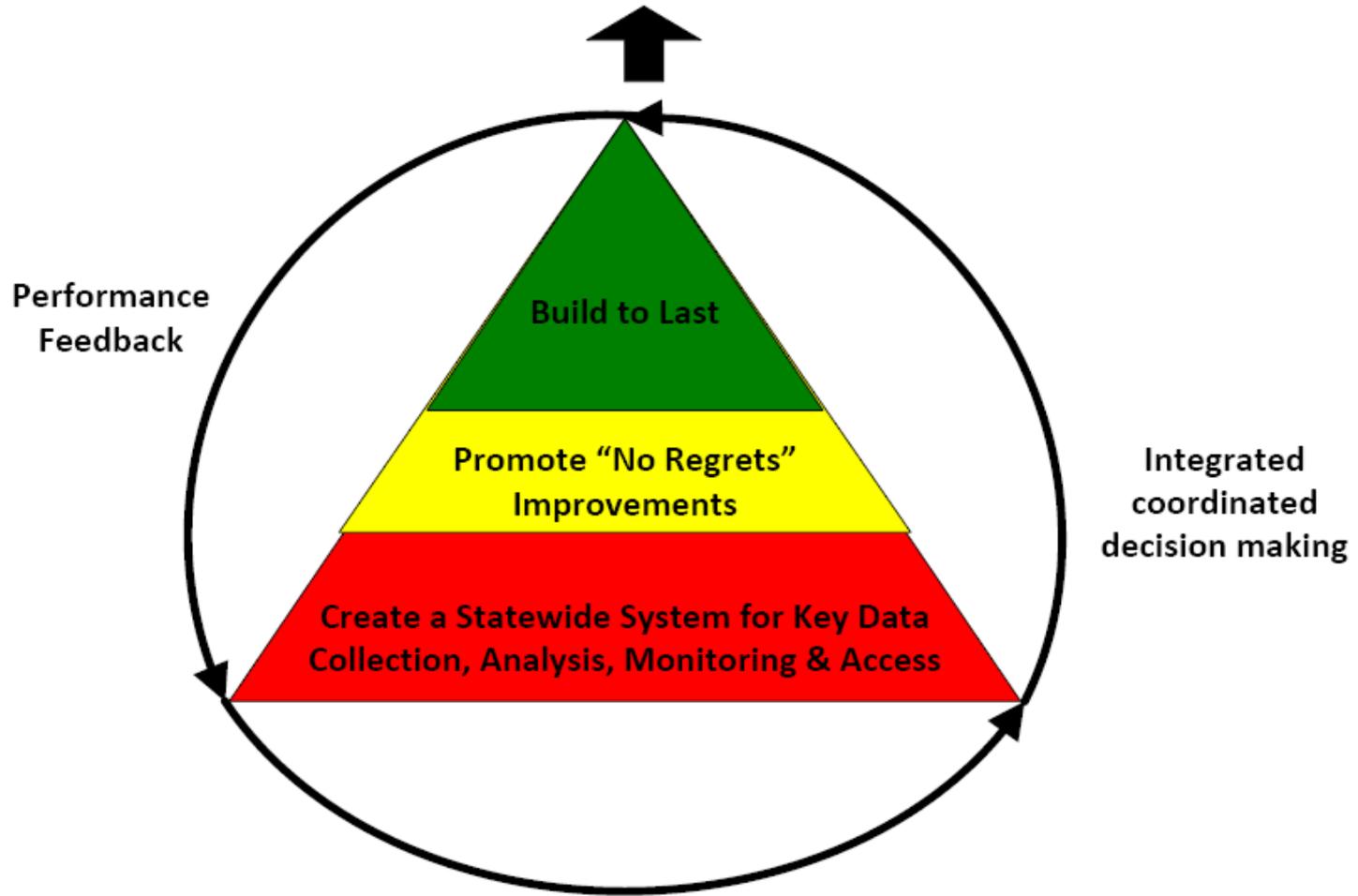
Updated key data analysis, aligned research and modeling outcomes

WHAT IS THE PI TWG ASKING THE STATE TO DO?

7 recommended actions, 3 of which are immediate next steps

3 IMMEDIATE ACTIONS

1. **Designate a lead entity to integrate overall efforts, whether it is an existing or new state agency/body.**

2. **Focus on public infrastructure improvements that add value, regardless of future climate change (i.e. "no regrets").**

3 IMMEDIATE ACTIONS

3. **Start (continue) systematic data collection, sharing and use (hazard analysis and vulnerability assessment; trend analysis).**

A. Gather climatic and other relevant environmental data.

B. Use it to update and run prediction models to yield more accurate erosion, flood, permafrost thaw and other rates.

➢ Model predicted rates on a regional basis.

➢ Distribute results to: a) infrastructure designers and engineers, and b) municipal/tribal governments, state/federal agencies and NGOs.

C. Use climatic data and updated erosion (and other) rates to run regional hazard analyzes and create updated vulnerability assessments.

➢ Distribute vulnerability assessment, in usable format to municipal/tribal governments, state/federal agencies and NGOs.

ONGOING ACTIONS

4. **Determine what action to take for existing infrastructure at risk.**

    A. Assess the structure and determine whether to move or protect it.

    B. Each case is different, but the process is the same. Use benefit/cost analysis to evaluate each alternative to determine the most attractive solution to provide resilience to withstand extreme weather events and a changing environment.

    C. Need to coordinate this decision-making rather than leave it up individual project managers without guidelines or policy.

5. **Build and expand data collection effort.**

2 'NEXT STEP' ACTIONS

6. **Amend engineering codes so new infrastructure can be designed to withstand new forces.**

    A. Sufficient climatic data to improve predicative models predicting conditions and expected erosion, flood, thaw and other rates.

    B. To evaluate existing infrastructure to identify common failure modes and routinely transmit this information into the engineering design and code creation process.

    C. Research and testing to identify which foundation types perform better in permafrost areas than others and are more resilient to climate change.

7. **Use coordinated information-sharing and decision-making to determine where to locate new infrastructure and how it should be designed and engineered.**

OVERVIEW PI TWG VISION & POLICIES

VISION

Sustainable Infrastructure that supports Communities in an Uncertain Environment

➢ Infrastructure is the platform upon which our society functions.

➢ To optimize investment opportunities, and demonstrate that the return on investment for Alaska's current and future infrastructure provides good value for the state and the nation….

An on-going, aligned statewide effort to monitor, analyze and proactively adapt to our changing environment is required.

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PI-1. CREATE A STATEWIDE SYSTEM FOR KEY DATA COLLECTION, ANALYSIS, MONITORING AND ACCESS

PI-1. 4 Points to Achieve – GATHER DATA

A. **Standardize information to be gathered.**

B. **Establish a baseline and benchmarks so that data comparison and analysis is possible….**

C. **….over time, regional geographic areas, and across agencies/parties.**

PI-1. 4 Points to Achieve – CREATE & SHARE INFORMATION

A. **Local <u>hazard analysis</u> based on up-to-date regional climate data.**

B. **<u>Vulnerability assessments</u> to rank the risk level, or vulnerability, of existing infrastructure for each region.**

C. **<u>Actionable format</u> to facilitate <u>sharing and use of this data</u> by municipal/ tribal governments, state/federal agencies, NGOs.**

PI-1. 4 Points to Achieve – PLAN REVIEW

A. **Gather and review planning documents for proposed public infrastructure.**

B. **Analyze plans to eliminate conflicts for renovation, retrofit, replacement, or relocation of existing infrastructure.**

PI-1. 4 Points to Achieve – FEEDBACK & IMPROVEMENT

A. **Use a performance feedback loop to identify measures to adapt design criteria for public infrastructure.**

B. **Use modeling to improve data alignment, scenarios, and assumptions for future infrastructure policies and plans.**

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PI-2. PROMOTE "NO REGRETS" IMPROVEMENTS

- PARTICULARLY RELEVANT GIVEN UNCERTAINTY.

- PRACTICES CAN BE UPDATED AS WE LEARN MORE.

PI-2. Use existing data & technology to..

➢ **Protect and extend the design service life of infrastructure.**

➢ **Reduce operating costs and complexity.**

➢ **Promote sustainability in the development, design and construction of new infrastructure.**

For Example…

❖ Protect key facilities from erosion/storm damage

❖ Install energy conservation upgrades

❖ Long term planning and preparedness

❖ Build local capacity

❖ Promote energy–efficient technologies

❖ Use alternative energy sources

❖ Build with better materials

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PI-3. BUILD TO LAST; BUILD RESILIENCY INTO ALASKA'S PUBLIC INFRASTRUCTURE

PI-3. Build resiliency by…

1. **Meet or exceed infrastructure design life.**
2. **Optimize life cycle costs/asset management practices.**
3. **Build structures to withstand extreme weather events and a changing environment. Build structures that use best science and appropriate building codes and engineering standards.**

IN CONCLUSION...

THE 3 THINGS THE PI TWG IS RECOMMENDING THE STATE DO NOW

to implement this system and create sustainable infrastructure that supports communities in an uncertain environment

3 IMMEDIATE ACTIONS

1. **Designate a lead entity to integrate overall efforts, whether it is an existing or new state agency/body.**

2. **Focus on public infrastructure improvements that add value, regardless of future climate change (i.e. "no regrets").**

3. **Start (continue) systematic data collection, sharing and use (hazard analysis and vulnerability assessment; trend analysis).**

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THANK YOU!

Questions & Answers…