



State of Alaska  
Governor's Climate Change Sub-Cabinet

Adaptation Advisory Group Meeting  
Meeting #7

Public Infrastructure TWG

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# Public Infrastructure

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

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

# **PI TWG Recommendations**

**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**

# Infrastructure is vulnerable to threats from:

- 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

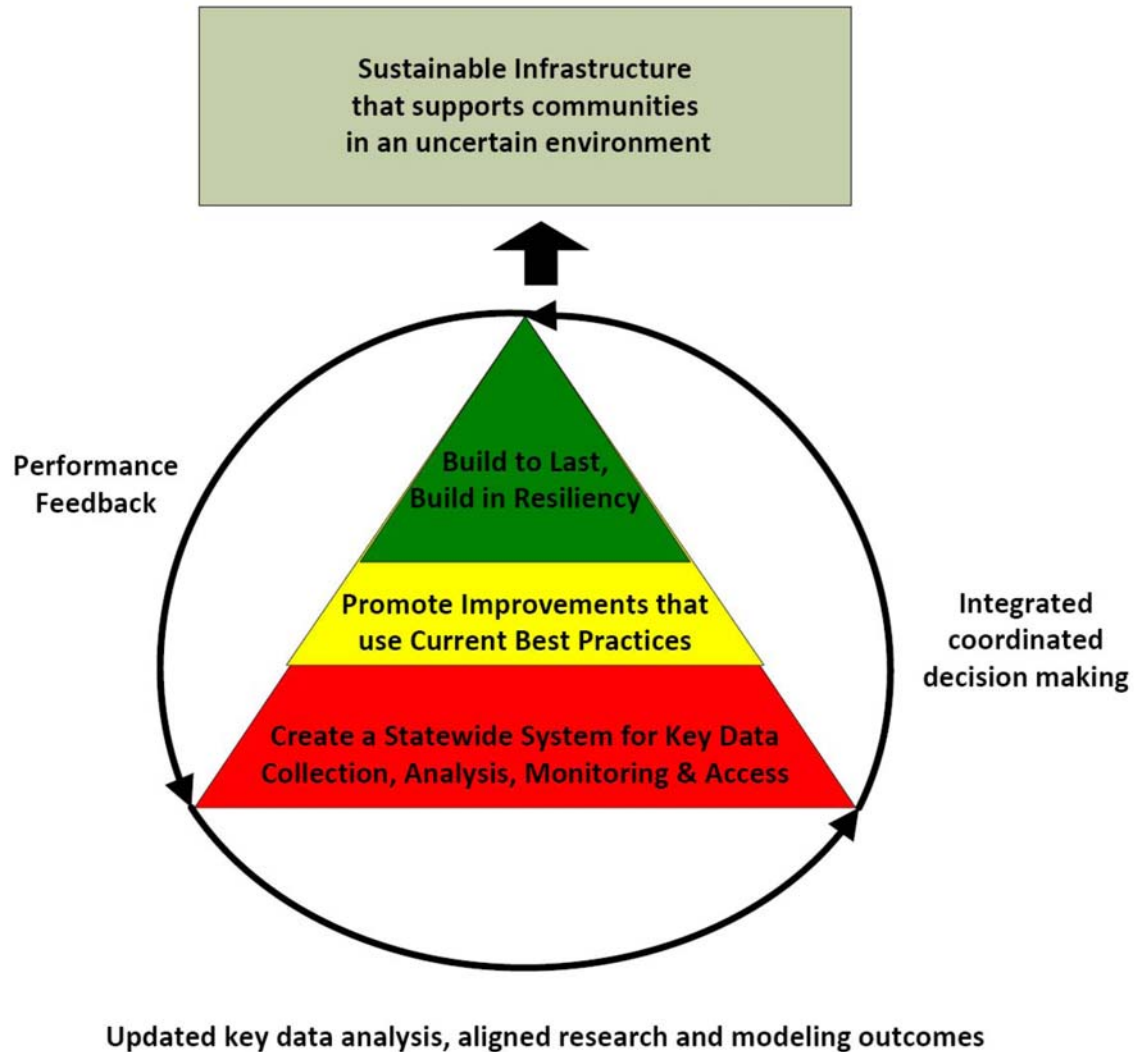
# PI TWG Vision

## **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.**

# Public Infrastructure Systems Approach



# 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 “Current Best Practices” Improvements
PI - 3	Build to Last. Build Resiliency into Alaska Public infrastructure. Vision

# WHAT IS THE PI TWG ASKING THE STATE TO DO?

7 recommended actions, 3 of which are immediate next steps



## 3 Immediate Next Steps

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. “best practices”).

# 3 Immediate Next Steps – cont'd

## **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.

## 2 “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.**

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

## [STEP 1: 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. CREATE A STATEWIDE SYSTEM FOR KEY DATA COLLECTION,  
ANALYSIS, MONITORING AND ACCESS**  
**[STEP 2: Create & Share Information]**

- A. Local hazard analysis based on up-to date regional climate data.
- B. Vulnerability assessments to rank the risk level, or vulnerability, of existing infrastructure for each region.
- C. Actionable format to facilitate sharing and use of this data by municipal/tribal governments, state/federal agencies, NGOs.

**PI-1. CREATE A STATEWIDE SYSTEM FOR KEY DATA  
COLLECTION, ANALYSIS, MONITORING AND ACCESS**  
**[STEP 3: 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. CREATE A STATEWIDE SYSTEM FOR KEY DATA COLLECTION,  
ANALYSIS, MONITORING AND ACCESS**  
**[STEP 4: 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.



# PI-2: Promote Improvements that Use Current Best Practices

- **Focus on public infrastructure improvements that add value, regardless of future climate change.**
- **Use existing technology and data to:**
  - Protect and extend design service life of infrastructure
  - Reduce operating costs and complexity
  - Promote sustainability in the development design and construction of new infrastructure.

**Standing still while waiting for  
improved forecasts of climate  
change impacts on  
infrastructure is not an option,  
therefore...  
promote use of current best  
practices.**

# Examples

- The use of existing technology such as adjustable and/or mobile building foundation systems,
- Building foundations that use thermosiphons or thermopiling,
- Protecting facilities from flood or erosion damage, or
- Providing energy conservation upgrades.
- Long-term planning and preparedness,
- Building local capacity for operations and maintenance,
- Promoting energy-efficient technologies,
- Using alternative energy sources,
- Using water conservation and reuse upgrades, or
- Building with better materials.

# **Actions of IAWG also exemplify this approach**

**In the case of each of the 6 imperiled communities, the IAWG:**

- Brought parties together, that had authority and funding, to collaborate on solutions.
- Completed overall vulnerability assessment for communities.
- Recommended a series of infrastructure improvements, tailored to each community's situation and needs, to integrate into near term plans to protect and/or extend the service life of each town site.
- Implementation of these recommendations has begun

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

### **Build Resiliency By These Measures:**

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.

# PI TWG is recommending the State take Action Now to:

- 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).**



*Thank You!*

<http://www.climatechange.alaska.gov/>

