

PI-2. Promote Improvements using Current Best Practices

Component Description

While the time for action is now, there are currently many uncertainties about the impacts of climate change on the public infrastructure in Alaska. How we deal with these uncertainties will ultimately determine how we adapt to a changing climate. For sure, as our predictions on future climate change become more accurate with the execution of PI-1 (Statewide, Systematic Collection, Analysis, Monitoring and Access of Key Data), the uncertainties are reduced. By accurately forecasting future climate change and its effects, we can better protect our existing infrastructure and better plan and design new infrastructure.

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Managing the risks and/or reducing the uncertainties associated with climate change will take time. Meanwhile, as data is being collected and analyzed, the focus should be on implementing public infrastructure improvement solutions that are worth doing regardless of climate change effects. This is the intent of PI-2, Promote Improvements using the Current Best Practices, of the PI TWG Sustainable Infrastructure System. This approach provides cost-effective and cost-saving benefits regardless of future climate changes. It creates balanced awareness by promoting agility and resiliency that does not overly depend on the potential consequences of future climatic events on infrastructure in Alaska.

Component Design

Structure/Design

Sustainable Infrastructure System Policy PI-1 will establish a data baseline, continue data collection over time, and improve trend analysis and forecasting tools as necessary to achieve the best value in our future infrastructure development. The ability to accurately forecast the effects of climate change are critical to success. However, our understanding today of climate change processes and the associated impacts in Alaska are incomplete, which makes it extremely difficult to adapt existing and new infrastructure to future changes in the environment. Due to these uncertainties, the overall infrastructure strategy will have to balance the short term need for agility with the long term need for resiliency of facilities to survive in an uncertain environment.

Projects that integrate the Current Best Practices provide the near term agility and long term resiliency vital to an effective response. Utilizing the most current information and technology, these projects focus on protecting Alaska's infrastructure investment regardless of climate change impacts by:

1. Protecting and extending the design service life of infrastructure,
2. Reducing infrastructure operating costs and complexity, and
3. Promoting sustainability in the development, design and construction of new infrastructure.

Implementing sustainable improvement projects will provide cost-effective benefits to communities even if the underlying climate change assumptions are incorrect. Implementation of a policy to repair and improve existing infrastructure will continue to build resilience that starts with Policy PI-1 (Systematic Key Data Collection, Analysis, Monitoring and Access) and ends with Policy PI-3 (Build to Last), which also requires a feedback loop on performance to integrate better improvement measures and options.

Promoting actions that rely on the Current Best Practices include adaptation of infrastructure to better withstand climate change impacts or mitigation actions designed to address the vulnerabilities of existing infrastructure. Examples of these adaptations include the use of existing technology such as adjustable and/or mobile building foundation systems, building foundations using thermosiphons or thermopiling, protecting facilities from flood or erosion damage or providing energy conservation upgrades. Mitigation actions include long-term planning and preparedness, capacity development, promoting energy-efficient technologies, using alternative energy sources, or building with better materials.

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An example of the use of current best practices in action today is the efforts of the Immediate Action Workgroup of the Governor’s Subcabinet on Climate Change. Over the past year the Workgroup has methodically labored to prevent loss of life and infrastructure and protect what is already in place in six imminently threatened rural Alaska communities. The Workgroup functions as an interim central coordination entity. Membership is comprised of an array of senior agency staffers that coordinate the various agency authorities and ensure that each agency acts in alignment with the others. These experienced members know who to coordinate with and how to make things happen within the State and Federal government.

Each of the six assigned communities has had an overall vulnerability assessment completed and recommended infrastructure improvements have been integrated into a series of near term plans to protect an/or extend the service life of each town site. Individual analysis of each location has enabled them to tailor best practice recommendations to each site.

- An emergency evacuation road has been proposed for Shaktoolik potentially enabling the current town site to be occupied for many more years. The availability of a safe evacuation route during winter storms will greatly reduce the risk of injury or death for residents and enable the continued utilization of town infrastructure for many years to come.
- Strengthening the existing revetment in Unalakleet was judged to be the appropriate approach to protect and extend the operating life of existing core town site infrastructure while a migration plan to the hillside was being developed.
- The concept of incremental relocation has been introduced at Newtok. The design and incremental construction of new community infrastructure has started at a new townsite in close proximity to the existing Newtok town site. This will enable the State to maximize the remaining service life of existing infrastructure and then incrementally build replacement stock in the new location. New homes are being designed to be relocateable, relying on the concept of resilience rather than strengthening foundations and armoring current locations.
- Kivalina and Shishmaref are relying on extensive new revetments to slow erosion and extend the service life of existing infrastructure.

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- No infrastructure improvements have been approved for Koyukuk yet. A feasibility study and community planning grant have been established to help the community create a plan that will have the unified support of residents and help protect the community from seasonal flooding.

Each community has been assessed and an individual current best practice plan has been put in place or is under development that will enable residents to better cope with their changing environment. The Current Best Practice approach enables the State to incrementally respond to communities across Alaska within available resources. The efforts and successes of the Immediate Action Workgroup provide an excellent model on which to effectively and efficiently protect our current infrastructure investment, while data is being collected and a longer term climate change strategy is being developed.

Targets/Goals/Timing

Implementation of PI-2 can begin immediately. During the initial phase (years 1-5) of deployment of the Sustainable Infrastructure System, PI-2 will proceed concurrently with Policy PI-1. As both efforts progress, Policy PI-3 (Build to Last) will be introduced. This third policy will overtake and replace PI-2 once the ability to accurately forecast the effects of climate change is firmly in place and adaptation strategies for future infrastructure are created.

Participants/Parties involved

Use of current best practices can be readily integrated in current funding agency infrastructure investment prioritization methodologies. This will enable federal and state agencies that already fund infrastructure development, construction and/or operation the opportunity for an orderly transition to developing “Build to Last (PI-3)” methods.

Infrastructure development, construction and operation are key responsibilities for all levels of government. Participation by federal and state agencies, municipal and tribal governments, design professionals and others will be necessary for the successful deployment of this policy.

Evaluation

Evaluation of the effectiveness of this policy will depend on establishing a regular schedule and process for sharing the results of implemented improvements. Opportunities for sharing current best practices and project administration/outcome feedback loops will need to be integrated into infrastructure funding awards, reporting and follow-up processes.

Research and Data Needs

While research and data are critical to the other policies of the Sustainable Infrastructure System, the ability to proceed based on the best available information provides the opportunity for agility and resiliency that makes this policy so valuable.

Implementation Mechanisms

PI-2 can be best implemented through close coordination among federal, state and local government agencies, academia and design professionals that fund and build infrastructure. This will allow alignment of process and purpose. This will be achieved most efficiently if a central coordination entity is established, within an existing state agency, to align implementation and communication horizontally among partner agencies and vertically between the various layers of government.

An implementation mechanism would be to routinely gather and make available information on measures and practices that are, and are not, working to adapt infrastructure. A program partner should be identified with the capability to organize and host an Information Center for sustainable and resilient best practices. This Center could index cost effective infrastructure development/protection techniques that work, techniques that didn't work, materials development and testing results, developing designs, contact information, and more.

A parallel implementation measure would be to integrate factors into existing funding prioritization formulas for evaluating infrastructure projects to reward consideration of climate change and the use of the current best practices. Funding agencies could include factors that result in higher scores for projects that:

- Utilize proven infrastructure development/protection techniques,
- Integrate sustainability strategies,
- Include value engineering reviews to reduce operating costs,
- Have a completed project site vulnerability assessment for the proposed project linked to an existing overall community vulnerability assessment
- Commit to proposed infrastructure performance reporting following project completion

By systematically rewarding behaviors that promote the funding of more resilient and sustainable infrastructure, the State will be better prepared to meet the future. More efficient information exchange will reduce the time typically needed to accomplish cycles of learning and performance improvement, further enhancing the effect.

As more climate change data becomes available it can readily be introduced into the information feedback loops established by this process and allow for a smoother transition into PI-3.

Related Policies/Programs and Resources

The other components of the Sustainable Infrastructure System are integrally related to the long term success of this component. All three policies must be initiated as a system to achieve the vision and to ensure the maximum return on investment.

Existing resources of the agencies that currently fund the development, construction and operation of infrastructure can be used to implement this policy.

Benefits and Costs

The public relies on infrastructure to provide a safe and healthy environment. Maintaining transportation and sanitation infrastructure are key to ensuring public health, safety and welfare are protected. Existing public infrastructure that is required to protect public health, safety and welfare must be repaired and upgraded so it is safe and operable. Implementing modifications and repairs using current best practices will maintain the functionality of existing infrastructure, extend its service life, potentially reduce or contain operating costs and sustain capital investment. The benefits to protecting public health, safety and welfare will outweigh the costs associated with the implementation of this methodology.

Feasibility and Constraints

The United States has the required technology and needed capacity to be successful in this endeavor. Public Infrastructure Policy PI-2 can be initiated with minimal additional resources; to optimize its effectiveness. A central coordinating entity should be established to ensure existing infrastructure funding, development, construction and operations agencies are better aligned.

Adequate funding is not available. However, this policy will help align funding opportunities and priorities.

Sufficient Alaska specific scientific research capacity does not yet exist to assure the long-term success of the overall Sustainable Infrastructure System

A coordinated statewide database with key information displayed and readily available to decision-makers in an understandable and actionable format does not currently exist.

The ability does not yet exist for state and federal agencies, and municipal and tribal governments to regularly communicate and share data or establish connected and aligned policies, procedures, and information to empower decision-makers.

TWG Approval and Deliberations

The PI TWG unanimously recommends approval of, “PI-2, Promote Improvements using the Current Best Practices.” All agree that implementing this component is critical for adapting Alaska’s public infrastructure to a changing climate.