Shishmaref Strategic Management Plan

Shishmaref, Alaska

September 2016

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Shishmaref Strategic Management Plan

Prepared for the State of Alaska
Department of Commerce, Community, and Economic Development (DCCED)
Division of Community and Regional Affairs
on behalf of the Community of Shishmaref
by HDR with RIM First People

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With special acknowledgement to the residents of Shishmaref, the community leadership, and the participants in the Shishmaref Interagency Working Group

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- Ester Iyatunguk, Member
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City of Shishmaref

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- William P. Jones, Vice Mayor
- Donna Barr, Secretary
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Executive Summary

Shishmaref is a traditional Inupiat village with a fishing and subsistence lifestyle. The community is located on Sarichef Island, a barrier island approximately 0.25 mile wide and about 3 miles long, but only one-third of the island is developable. The island was formed by frozen sandy soils, which are susceptible to significant erosion. The primary erosion hazards are wave and slough erosion, sea ice gouging, and slumping resulting from melting permafrost. The entire community is susceptible to erosion, and the underlying permafrost is melting. According to the local hazard mitigation plan, "the effects of climate change are expected to add to natural hazards including flooding in coastal areas. As sea level rises and the offshore ice pack retreats, more coastal flooding can be expected."

Government agencies consider Shishmaref to be one of four communities in immediate need of relocation (GAO 2009), and the State of Alaska Immediate Action Workgroup included it in the six top-priority communities referenced in this document as "at-risk communities."[1] A clear plan of action with widespread community and agency support will increase Shishmaref's chances of receiving future funding to relocate the community.

The community voted to relocate in May 1973 and again in July 2002. While the community has pursued relocation since then, several events have caused the relocation efforts to lose momentum (NRCS 2003). The relocation site proposed in the 1970s was determined to be on permafrost-rich ground and unsuitable for development. A school built in 1977 was an important infrastructure investment in the community that they did not want to abandon. The community is currently undertaking a study to identify a suitable site for relocation. Pending the results of the study, the community will decide if they will continue to pursue relocation or adopt a "defend in place" approach.

Over the past 20 years, Shishmaref has experienced several erosive storms. For example, during a storm in October 1997, 30 feet of the north shore was eroded. As a result, 14 homes and the National Guard Armory were forced to relocate. After additional storms forced the relocation of 5 other homes, the community voted again in July 2002 to relocate the entire community.

What is resilience?

This *Strategic Management Plan* (SMP) will provide the "blueprint" for how the community and agencies will proceed to make Shishmaref a more resilient community.

The term "resilience" is defined for the purposes of the SMP as the following (DCCED 2012):

[1] The Immediate Action Workgroup is a workgroup of the Alaska Governor's Sub-cabinet on Climate Change.

> *Resilience is the capability to anticipate risk, limit impact, and bounce back rapidly through survival, adaptability, evolution, and growth in the face of turbulent change. A resilient community is not only prepared to help prevent or minimize the loss or damage to life, property and the environment, but also it has the ability to "bounce back," i.e., quickly return citizens to work, reopen businesses, and restore other essential services needed for a full and swift economic recovery.*

Creating a resilient community requires developing a new way of approaching issues, engaging a diverse range of stakeholders, integrating the planning process across disciplines and levels of government, and coordinating available funding with resilience needs. A resilient community has five basic dimensions:

- **Political and government** systems that promote leadership, inclusive decision making, stakeholder engagement, and integrated planning;
- **Environment** that provides resources, does not worsen hazards, and enhances quality of life;
- **Social/culture** connection that creates a community identify, ties community residents together, honors their heritage, and promotes a willingness to accept other cultures;
- **Robust economy** that provides employment opportunities, financial well-being, and economic prosperity; and
- **Infrastructure** that meets basic needs, provides critical community services, reduces community vulnerability, and is within the community's ability to operate and maintain.

SMP Planning Process

The SMP provides a framework to accomplish Shishmaref's goal of a more resilient community. The SMP process was performed in two phases. Phase 1 focused on issue identification, review of background information, development of guiding principles, and the creation of a *Background Planning Report*. Phase 2 focused on identifying the strategic actions to address the issues identified in Phase 1. Phase 2 is documented in the SMP.

Many residents of Shishmaref, along with representatives from local, regional, state, and federal agencies and organizations, contributed to the creation of the SMP. They participated in community meetings, agency meetings, completed surveys, and provided feedback to community leadership. A list of participants in the Shishmaref Interagency Working Group can be found in Appendix A. Additional information about community involvement can be found in Appendix B.

Vision

During Phase 1, based on community input, the following Vision Statement was developed to provide direction to the SMP process.

> *Shishmaref is a safe and resilient community. We want to be a viable community that respects and honors our Inupiat culture and traditional values. We will work together and with partners to develop projects and policies to protect our residents, infrastructure, natural environment, and subsistence resources. We will preserve and enhance our community for us and future generations.*

Guiding Principles

Guiding principles provide the overall direction for the Shishmaref SMP. Combined with the Vision Statement, they are the foundation for the SMP and provide a context for decision making so that limited capital resources can be maximized. The guiding principles were developed based on information from a literature review and community input. These principles will be used to help Shishmaref achieve its goals, as well as to evaluate potential actions, which should be consistent with the guiding principles.

The SMP's guiding principles are:

- Residents must be safe from natural hazards and growing threats of flooding and erosion.
- Respect and honor each person's views and ideas.
- Make decisions openly and as a community. Everyone's participation is valuable, as each person brings a different insight, perspective, and knowledge.
- Include local input in the process.
- Protect the natural environment.
- Respect our traditional culture.
- Use funds wisely.
- Develop in a manner that strengthens the community.
- Encourage local hire.

Reasons to Develop a Strategic Management Plan

The SMP identifies what activities the community needs to pursue, who is responsible for each action item, when an action should occur, what scale of financial resources are needed, and what entities can assist with implementation of the action item. Reasons to develop the SMP include:

- **Establish priorities** – What should we be working on and what should we work on first?
- **Simplify decision making** – When faced with new ideas and potential projects, community leadership can use the SMP to determine if an idea or project helps implement the vision and is consistent with guiding principles.
- **Maintain focus** – This makes it easier to say no to items that may distract from the community's objectives.
- **Lend credibility to the actions** – The SMP demonstrates that the community and other stakeholders are organized and have thought about their future. Funding entities often want to see this.
- **Enhance communication** – The SMP allows everyone to see where the community is going and how the action items will be achieved.
- **Promote efficiency** – Efficiency will save time, energy, and resources in the long run.
- **Create accountability** – Accountability shows what entity is responsible for each item.

The process used to develop the Shishmaref's SMP included the five steps outlined below.

Development of Strategic Management Plan

Identification of Issues

The development of the SMP plan started with the identification of issues in Phase 1 of the project. The key resiliency-related issues identified in Shishmaref include:

- Lack of/Inadequate Community Infrastructure
- Inadequate Housing
- Jobs and Economic Development
- Extend and Maintain Seawall
- Lack of Evacuation Shelter/Place of Refuge
- Funding

Strategic Focus Areas

Based on the issues identified in Phase 1, strategic focus areas were identified. Strategic focus areas expand on the vision and start to create a structure for how to achieve the vision. The following strategic focus areas were identified:

- Adaptable Built Environment
- Safe and Healthy Housing
- Jobs and Economic Development

- Proactive Emergency Management
- Strengthened Traditional Culture
- Leadership for the Future
- Relocation
- Other

Preliminary Planning Schedule

Based on the strategic focus areas and the known issues, a preliminary planning schedule was created. First, the project team identified action items that helped implement the vision and were consistent with guiding principles. Each action item was then identified as short-term, medium-term, or long-term depending on when the action was likely to be needed and the likely availability of funding. The preliminary planning schedule was then refined based on community and agency input.

Work Breakdown Structure

The preliminary planning schedule was refined into a comprehensive work breakdown structure (WBS) framework as a means to implement Shishmaref's resiliency vision and allow them to "defend in place." A WBS is used to break down a project into manageable actions. It helps with project organization, assists with assigning responsibilities, helps with estimating costs and scheduling, and can help project stakeholders by providing further definition and detail of each task.

This WBS includes a discussion of strategic focus areas and lays out action items that should be undertaken by the community and their partners over the next 20 years.

Identification of Imminent and Critical Actions

In an emergency, the highest priority is the health and safety of community residents. This involves making sure procedures, training, and equipment are available for a safe evacuation or to shelter in place. Imminent actions are those actions the community needs in place today to protect people from harm during a hazard event. The imminent actions identified for Shishmaref are:

Decision Regarding Relocation

Shishmaref recently completed a site feasibility study and now must decide if they will relocate to one of the three potential sites or protect in place for the long-term survival of the community. The community is scheduled to vote on this issue in July 2016. The results of this vote will provide a clear vision of Shishmaref's future so the community can start concentrating on implementing their preferred choice.

Emergency Drills and Exercises

Emergency drills and exercises provide an opportunity to practice aspects of an emergency plan, allowing people to become familiar with what is expected of them during an emergency and help identify whether the plan meets community needs or if changes need to be made.

Critical actions are those action items that, if not completed in 5 years, will result in a negative impact on community safety. Implementation of critical actions should be undertaken immediately with a goal of completing or substantially completing the action within 5 years. The identified critical actions are

actions that are especially important for increasing community resiliency now. Criteria for identifying critical actions were:

- Does it save lives?
- Does it protect property?
- Can it be re-used or re-purposed in another location?

Additional considerations for identifying critical actions were:

- Does it address immediate priorities (e.g., food, water, energy, shelter)?
- How does it reflect community priorities? Does it support "Shelter in Place?"
- Is there funding available?
- Can it be fully implemented within the next 5 years?

The critical actions identified are summarized below. For information on the other action items identified, see Section 3 of the SMP.

CRITICAL ACTION – Water and Sewer Upgrades

The majority of homes in Shishmaref rely on hauling water from the washeteria and honey buckets. Water and sewer upgrades were considered critical by the community to improve their quality of life and public health. Based on community needs, three priority water and sewer upgrades have been identified: improved delivery of drinking water and sewage disposal services, increased water supply, and protection of the sewage lagoon. Improving the delivery of drinking water and sewage disposal services does not mean installing a piped water and sewer system. Globally, a wide variety of innovative decentralized water and sewer systems have been developed that, if implemented, could meet Shishmaref's basic sanitation needs. Shishmaref's existing water supply and storage tanks are in poor condition and do not have capacity to meet community needs. Shishmaref sometimes has to ration water, which has a negative health impact. Additional water storage would allow residents to better meet their needs and reduce sanitation-related illnesses. Shishmaref's sewage lagoon is vulnerable to storm surge and erosion. A breach of the sewage lagoon would present a substantial health risk; it needs to be protected.

CRITICAL ACTION – Evacuation Center

One of the biggest concerns in Shishmaref is having a safe place to be during storms. The school and church serve as evacuation shelters; however, they may not be large enough to house everyone. They may also be impacted during extreme storms. The church also does not have running water, emergency supplies, and other necessities, which limits its usefulness as an emergency shelter. Residents need an evacuation center so they have a safe place to use during and after a storm or other emergency.

CRITICAL ACTION – Coastal Flood Analysis

A coastal flood analysis will identify the likelihood and severity of coastal flooding in Shishmaref. The results of the analysis will help Shishmaref with future planning efforts, studies, and projects.

CRITICAL ACTION – Seawall – Phases 3 and 4

The remaining phases of the seawall need to be constructed to protect the northern edge and southwest portion of Shishmaref.

CRITICAL ACTION – Improved Housing

Access to safe, quality, and affordable housing is vital for any community. Community residents have expressed a need to improve the housing in Shishmaref to address overcrowding, energy efficiency, affordability, and poor structural conditions.

CRITICAL ACTION – Traditional Knowledge

Alaska Natives have a unique understanding of the connections between people and their environment. Shishmaref should work with its partner agencies to ensure that traditional knowledge is not discounted. Rather, Shishmaref needs to encourage the blending of traditional knowledge and western science so that all organizations can develop a better understanding of climate change and community impacts.

CRITICAL ACTION – Leadership Development

Leaders must have the foresight to see potential challenges, plan for the future, and be involved in decision-making processes on behalf of the community. Shishmaref has expressed the need for more leadership development opportunities to ensure future community leaders have the necessary skills to work with community residents, government agencies, and others to implement their vision of a resilient Shishmaref.

CRITICAL ACTION – Improve Government-to-Government Relations

Improving government-to-government relations will help elicit trust among different government levels—tribal council, city, regional, and state—as well as various state agencies. Continued interaction and correspondence will help ensure that everyone is on the same page with the same ideas, and no relationships are destroyed through the process.

Each critical action is described in additional detail, along with its responsible and potential/coordinating parties, timeframe, estimated cost, current status, and reference, in Section 3 of the SMP.

Strategic Management Plan Organization

The SMP is organized by strategic focus area. Within each focus area, critical action items are identified first, followed by short-, medium-, and long-term action items. For each action item, the following details were identified:

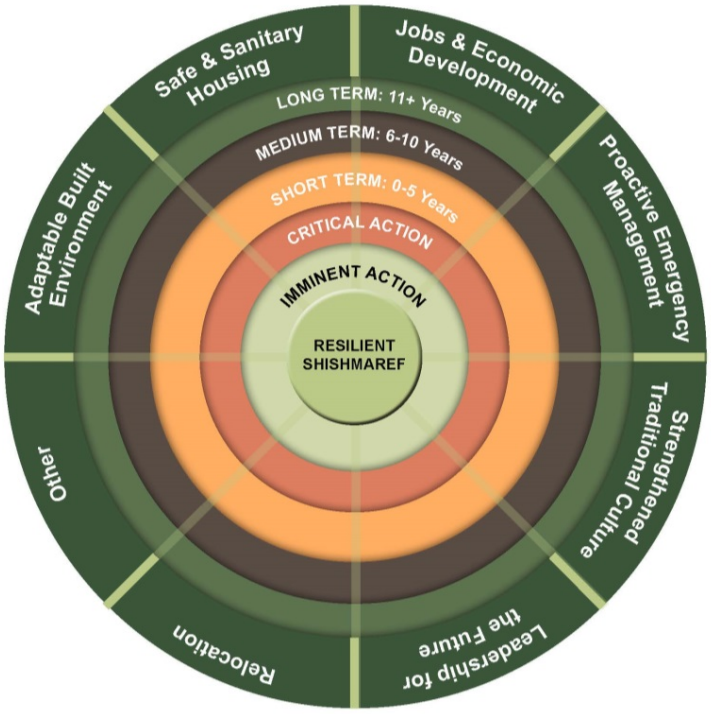
- **Responsible Party** – Which agency or organization has the primary responsibility for championing the action?
- **Potential Partners/Coordination** – What entities may be willing to partner with the responsible party and how can the partnership be coordinated?
- **Timeframe for Implementation** – When is the action item needed?
- **Estimated Cost** – What is the planning level cost estimate (when available)?
- **Current Status** – What is the current status of the project?

- **Reference** – What is the source of the action item, if it originated from another community plan?

The action items have been identified through the *Background Planning Report* and the first two Interagency Working Group Meetings. Completing the items on the list does not automatically mean Shishmaref is a resilient community; resilience is a process of continual improvement. The SMP is a work in progress, and should be kept visible and revised periodically to meet changing community needs. As the community makes progress on current action items, the SMP should be updated to remove completed action items and add new ones.

Actions will trigger other actions and opportunities to defend in place. The timelines are not meant to be a mandatory schedule; they are guidelines for future planning efforts. Implementation of actions will depend on availability of resources and community priorities.

Strategic Management Plan Overview



Next Steps

The next step is for the community to lead the implementation of the SMP. Specific steps include:

- **Accountability** – Having a plan is not the same as implementing the plan. To be successful, Shishmaref needs to identify specific people to be responsible for each action item. These individuals should report back to the community on a regular basis.
- **Monitoring** – Shishmaref should decide how they want to monitor and update the SMP. The SMP is a living document to help the community become more resilient. The community should

work with their partners to assess the plan and update it at least annually. Keep the plan fluid – adapt to changes. Don't be afraid to change the plan if needed.

- **Support** – Gain support to implement action items from existing and new partners.
- **Communication** – Keep people informed of progress. Shishmaref should share with residents and agency partners the progress they have made in implementing the plan.
- **Celebration** – As action items are completed, or at substantial milestones, celebrate these accomplishments. Celebrations can help keep everyone excited and engaged.

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Abbreviations

ADEC	Alaska Department of Environmental Conservation
ADF&G	Alaska Department of Fish and Game
AEA	Alaska Energy Authority
AHFC	Alaska Housing Finance Corporation
ANA	Administration for Native Americans
ANTHC	Alaska Native Tribal Health Consortium
ATV	All-Terrain Vehicle
AVEC	Alaska Village Electric Cooperative
BHLBNP	Bering Heritage Land Bridge National Preserve
BIA	Bureau of Indian Affairs
BSSD	Bering Strait School District
CAA	Clean Air Act
CCHRC	Cold Climate Housing Research Center
DCCED	Alaska Department of Commerce, Community, and Economic Development
DGGS	Division of Geological and Geophysical Services
DHS&EM	Division of Homeland Security and Emergency Management
DNR	Alaska Department of Natural Resources
DOT&PF	Alaska Department of Transportation and Public Facilities
DPS	Department of Public Safety
EOP	Emergency Operations Plan
EPA	U.S. Environmental Protection Agency
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FTH	Flush Tank Haul
GAO	Government Accountability Office
HIP	Housing Improvement Program
HUD	Department of Housing and Urban Development
ICDBG	Indian Community Development Block Grant
IRA	Indian Reorganization Act
NCAI	National Congress of American Indians
NOAA	National Oceanic and Atmospheric Administration
NSHC	Norton Sound Health Corporation
RurAL CAP	Rural Alaska Community Action Program, Inc.
SCERP	Small Community Emergency Response Plan
SMP	Strategic Management Plan
SNC	Shishmaref Native Corporation
UDDT	Urine-Diverting Dry Toilet
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
VPSO	Village Public Safety Officer
VSW	Village Safe Water
WBS	Work Breakdown Structure

1 Introduction

Shishmaref is a traditional Inupiat village with a fishing and subsistence lifestyle. The community is located on Sarichef Island, a barrier island approximately 0.25 mile wide and about 3 miles long, but only one-third of the island is developable. The island was formed by frozen sandy soils, which are susceptible to significant erosion. The primary erosion hazards are wave and slough erosion, sea ice gouging, and slumping resulting from melting permafrost. The entire community is susceptible to erosion, and the underlying permafrost is melting. According to the local hazard mitigation plan, "the effects of climate change are expected to add to natural hazards including flooding in coastal areas. As sea level rises and the offshore ice pack retreats, more coastal flooding can be expected."

The Government Accountability Office (GAO) found that at least 184 of Alaska's 214 villages have experienced some degree of erosion or flooding (GAO 2003).[1] Government agencies consider Shishmaref to be one of four communities in immediate need of relocation (GAO 2009), and the State of Alaska Immediate Action Workgroup included it in the six top-priority communities referenced in this document as "at-risk communities."[2] A clear plan of action with widespread community and agency support will increase Shishmaref's chances of receiving future funding to relocate the community.

> *We need to relocate soon so we don't have to leave our children responsible for moving the village. They need somewhere some to live with no worries of falling in to the ocean.*
>
> - *Community survey*

The community voted to relocate in May 1973 and again in July 2002. While the community has pursued relocation since then, there have been several events that caused the relocation efforts to lose momentum (NRCS 2003). The relocation site proposed in the 1970s was determined to be on permafrost-rich ground and unsuitable for development. A school built in 1977 was an important infrastructure investment in the community that they did not want to abandon. The community is currently undertaking a study to identify a suitable site for relocation. Pending the results of the study, the community will decide if they will continue to pursue relocation or adopt a "defend in place" approach.

[1] The Government Accountability Office is an investigative arm of Congress that was requested to study erosion and flooding in Alaska villages.
[2] The Immediate Action Workgroup is a workgroup of the Alaska Governor's Sub-Cabinet on Climate Change.

Over the past 20 years, Shishmaref has experienced several erosive storms. For example, during a storm in October 1997, 30 feet of the north shore was eroded. As a result, 14 homes and the National Guard Armory were forced to relocate. After additional storms forced the relocation of 5 other homes, the community voted again in July 2002 to relocate the entire community.

1.1 What is resilience?

This *Strategic Management Plan* (SMP) will provide the "blueprint" for how the community and agencies will proceed to make Shishmaref a more resilient community.

There is no universal definition of resilience. The term "resilience" has emerged from the field of ecology. It describes the capacity of a system to maintain or recover functionality after a disruption or disturbance. For the purposes of the SMP, the following definition is used (DCCED 2012):

> *Resilience is the capability to anticipate risk, limit impact, and bounce back rapidly through survival, adaptability, evolution, and growth in the face of turbulent change. A resilient community is not only prepared to help prevent or minimize the loss or damage to life, property and the environment, but also it has the ability to "bounce back," i.e., quickly return citizens to work, reopen businesses, and restore other essential services needed for a full and swift economic recovery.*

Creating a resilient community is not about following a series of defined action items; rather, it requires developing a new way of approaching issues. It requires engaging a diverse range of stakeholders, integrating the planning process across disciplines and levels of government, and coordinating available funding with resilience needs (see Figure 1). A resilient community has five basic dimensions:

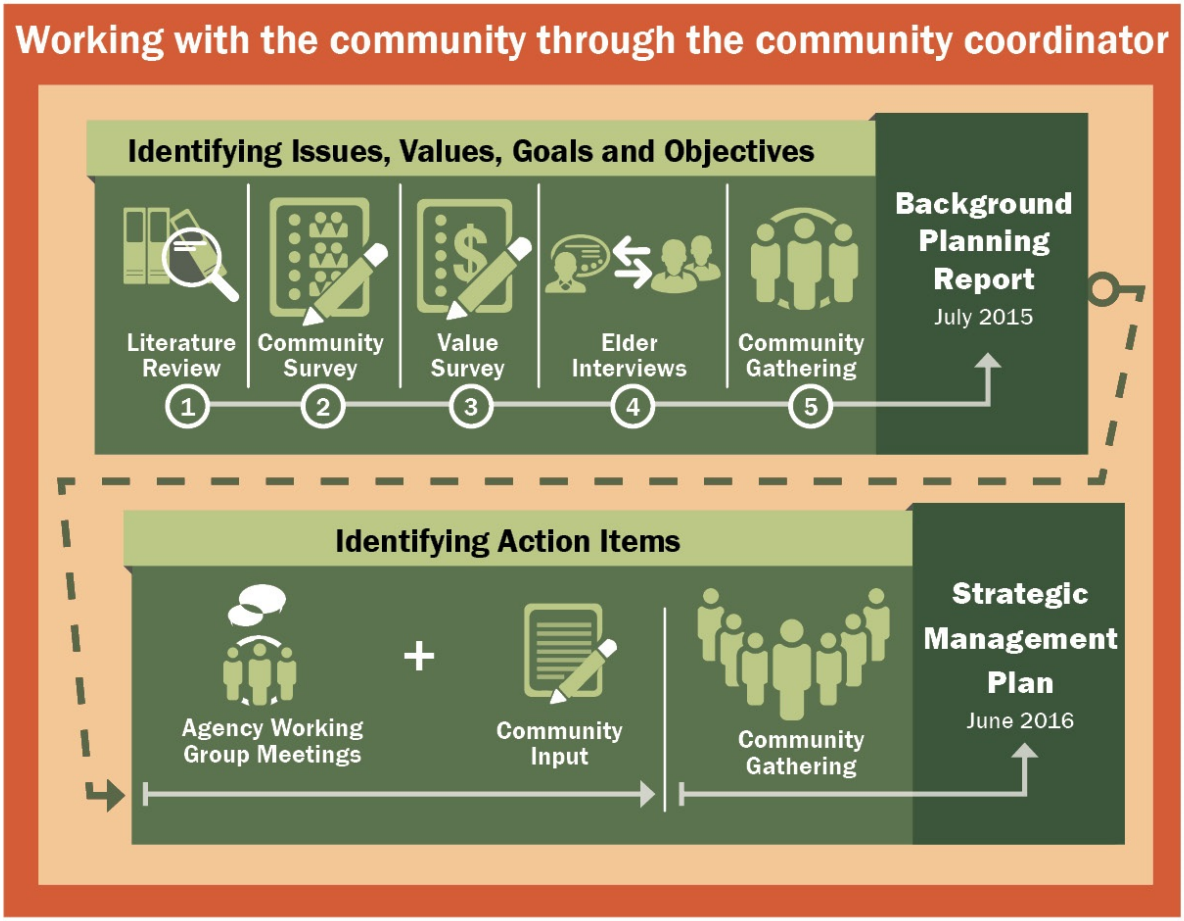
- **Political and government** systems that promote leadership, inclusive decision making, stakeholder engagement, and integrated planning;
- **Environment** that provides resources, does not worsen hazards, and enhances quality of life;
- **Social/culture** connection that creates a community identify, ties community residents together, honors their heritage, and promotes a willingness to accept other cultures;
- **Robust economy** that provides employment opportunities, financial well-being, and economic prosperity; and
- **Infrastructure** that meets basic needs, provides critical community services, reduces community vulnerability, and is within the community's ability to operate and maintain.

Figure 1. Resiliency Relationships

1.2 SMP Planning Process

The SMP provides a framework to accomplish Shishmaref's goal of a more resilient community. The SMP process was performed in two phases. Phase 1 focused on issue identification, review of background information, development of guiding principles, and creation of a *Background Planning Report*. Phase 2 focused on identifying the strategic actions to address the issues identified in Phase 1. Phase 2 is documented in this *Strategic Management Plan*. The process used to develop the *Background Planning Report* and *Strategic Management Plan* is shown in Figure 2.

Figure 2. Planning Process



Many residents of Shishmaref, along with representatives from local, regional, state, and federal agencies and organizations, contributed to the creation of this SMP. They participated in community meetings, agency meetings, completed surveys, and provided feedback to community leadership. Members of the Shishmaref Interagency Working Group can be found in Appendix A. Additional information about community involvement can be found in Appendix B.

1.3 Vision

During Phase 1, based on community input, the following Vision Statement was developed to provide direction to the SMP process.

> *Shishmaref is a safe and resilient community. We want to be a viable community that respects and honors our Inupiat culture and traditional values. We will work together and with partners to develop projects and policies to protect our residents, infrastructure, natural environment,*

and subsistence resources. We will preserve and enhance our community for us and future generations.

1.4 Guiding Principles

Guiding principles provide the overall direction for the Shishmaref SMP. The guiding principles, combined with the Vision Statement, are the foundation for the SMP and provide a context for decision making so that limited capital resources can be maximized. Based on information from a literature review and community input, additional guiding principles were developed. These principles will be used by the community and agencies to help Shishmaref achieve its goals, as well as to evaluate potential actions. If actions are not consistent with the guiding principles, they should not be undertaken. It is the hope and intent of residents that partners working to make Shishmaref more resilient will respect and promote these principles.

The SMP's guiding principles are:

- Residents must be safe from natural hazards and growing threats of flooding and erosion.
- Respect and honor each person's views and ideas.
- Make decisions openly and as a community. Everyone's participation is valuable, as each person brings a different insight, perspective, and knowledge.
- Include local input in the process.
- Protect the natural environment.
- Respect our traditional culture.
- Use funds wisely.
- Develop in a manner that strengthens the community.
- Encourage local hire.

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2 Reasons to Develop a Strategic Management Plan

To help Shishmaref implement their vision and increase resiliency, the SMP was developed.

The SMP identifies what activities the community needs to pursue, who is responsible for each action item, when an action should occur, what scale of financial resources are needed, and what entities can assist with implementation of the action item.

Reasons to develop a SMP include:

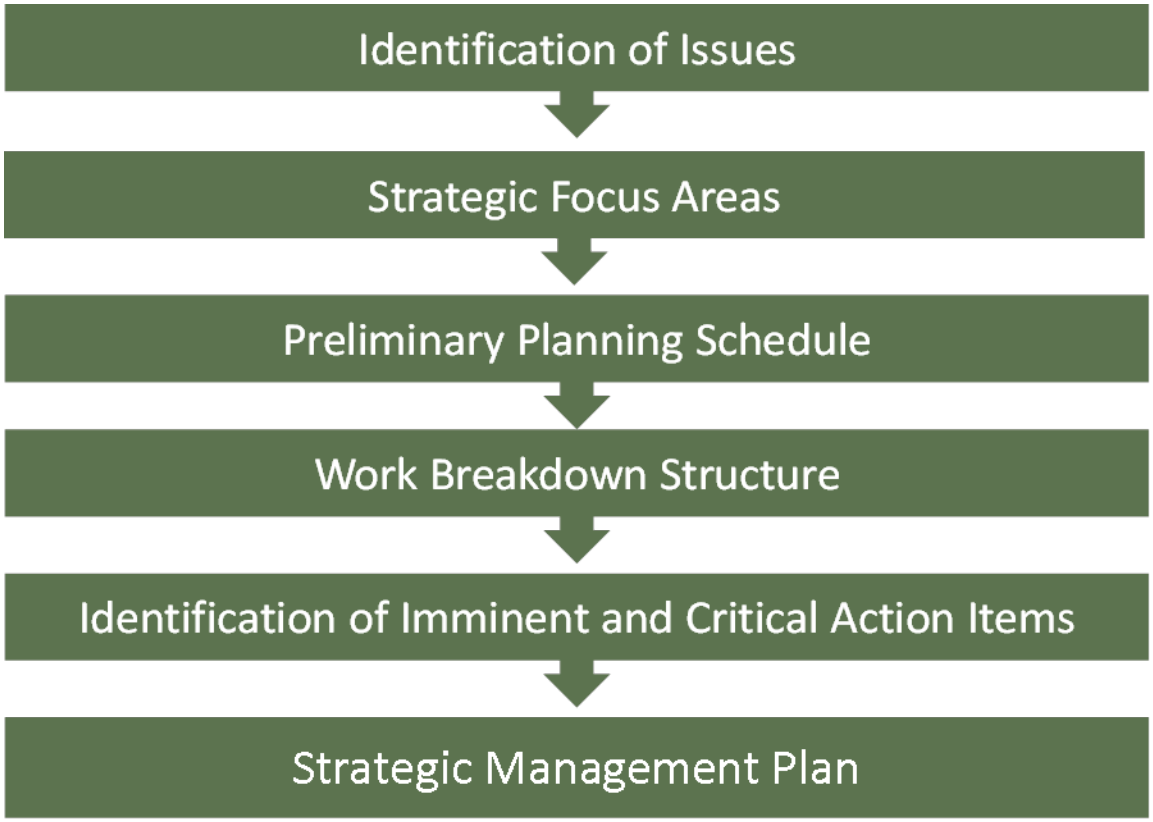
- **Establish priorities** – What should we be working on and what should we work on first?
- **Simplify decision making** – When faced with new ideas and potential projects, community leadership can use the SMP to determine if an idea or project helps implement the vision and is consistent with guiding principles.
- **Maintain focus** – This makes it easier to say no to items that may distract from the community's objectives.
- **Lend credibility to the actions** – The SMP demonstrates that the community and other stakeholders are organized and have thought about their future. Funding entities often want to see this.
- **Enhance communication** – The SMP allows everyone to see where the community is going and how the action items will be achieved.
- **Promote efficiency** – Efficiency will save time, energy, and resources in the long run.
- **Create accountability** – Accountability shows what entity is responsible for each item.

Reasons to develop a strategic management plan include:

- Establish priorities
- Simplify decision making
- Maintain focus
- Lend credibility to the actions
- Communication
- Promote efficiency
- Foster accountability

The process used to develop Shishmaref's SMP is shown in Figure 3.

Figure 3. Development of Strategic Management Plan



2.1 Identification of Issues

The development of the SMP started with the identification of issues in Phase 1 of the project. The key resiliency-related issues identified in Shishmaref include:

- Lack of/Inadequate Community Infrastructure
- Inadequate Housing
- Jobs and Economic Development
- Extend and Maintain Seawall
- Lack of Evacuation Shelter/Place of Refuge
- Funding

Additional information about the issues can be found in Section 6 of the *Background Planning Report*.

2.2 Strategic Focus Areas

Based on the issues, strategic focus areas were identified. Strategic focus areas expand on the vision and start to create a structure for how to achieve the vision. Based on the issues identified in the *Background Planning Report*, the following strategic focus areas have been identified:

- Adaptable Built Environment
- Safe and Healthy Housing
- Jobs and Economic Development

- Proactive Emergency Management
- Strengthened Traditional Culture
- Leadership for the Future
- Relocation
- Other

2.3 Preliminary Planning Schedule

Based on the strategic focus areas and the known issues, a preliminary planning schedule was created. First, the project team identified action items that helped implement the vision and were consistent with guiding principles. Each action item was then identified as short-term, medium-term, or long-term depending on when the action was likely to be needed and the likely availability of funding. The preliminary planning schedule was then refined based on community and agency input. The resulting preliminary planning schedule is shown in Appendix C.

2.4 Work Breakdown Structure

The preliminary planning schedule was refined into a comprehensive work breakdown structure (WBS) framework as a means to implement Shishmaref's resiliency vision and allow them to "defend in place." A WBS is used to break down a project into manageable actions. A WBS is often used to make complex projects more manageable because it helps with project organization, assists with assigning responsibilities, helps with estimating costs and scheduling, and can help project stakeholders by providing further definition and detail of each task.

This WBS includes a discussion of strategic focus areas and lays out action items that should be undertaken by the community and their partners over the next 20 years. For each focus area, several strategies have been identified to provide additional guidance and focus. The implementation of the strategies through action items is how Shishmaref will become a more resilient community.

The SMP WBS overview is shown in Appendix D.

2.5 Identification of Imminent and Critical Actions

In an emergency, the highest priority is the health and safety of community residents. This involves making sure procedures, training, and equipment are available for a safe evacuation or to shelter in place. Imminent actions are those actions the community needs in place today to protect people from harm during a hazard event. The imminent actions identified for Shishmaref are:

Decision Regarding Relocation

Shishmaref recently completed a site feasibility study and now must decide if they will relocate to one of the three potential sites or protect in place for the long-term survival of the community. The community is scheduled to vote on this issue in summer 2016. The results of this vote will provide a clear vision of Shishmaref's future so the community can start concentrating on implementing their preferred choice.

Emergency Drills and Exercises

Emergency drills and exercises provide an opportunity to practice aspects of an emergency plan, allowing people to become familiar with what is expected of them during an emergency and help identify whether the plan meets community needs or if changes need to be made.

Implementation of critical actions should be undertaken by the community and their partners immediately, with a goal of completing the project (or substantial completion of) within the next 5 years. The identified critical actions are actions that are especially important for increasing community resiliency now. Critical projects are those projects that, if not completed in 5 years, will result in a negative impact on community safety.

Criteria for identifying critical actions were:

- Does it save lives?
- Does it protect property?
- Can it be re-used or re-purposed in another location?

Additional considerations for identifying critical actions were:

- Does it address immediate priorities (e.g., food, water, energy, shelter)?
- How does it reflect community priorities? Does it support "Shelter in Place?"
- Is there funding available?
- Can it be fully implemented within the next 5 years?

The critical actions identified for Shishmaref are summarized below:

- **Water and Sewer Upgrades** – The majority of homes in Shishmaref rely on hauling water from the washateria and honey buckets. Water and sewer upgrades were considered critical by the community to improve their quality of life and public health. Based on community needs, three priority water and sewer upgrades have been identified: improved delivery of drinking water and sewage disposal services, increased water supply, and protection of the sewage lagoon. Improving the delivery of drinking water and sewage disposal services does not mean installing a piped water and sewer system. Globally, a wide variety of innovative decentralized water and sewer systems have been developed that, if implemented, could meet Shishmaref's basic sanitation needs. Shishmaref's existing water supply and storage tanks are in poor condition and do not have capacity to meet community needs. Shishmaref sometimes has to ration water, which has a negative health impact. Additional water storage would allow residents to better meet their needs and reduce sanitation-related illnesses. Shishmaref's sewage lagoon is vulnerable to storm surge and erosion. A breach of the sewage lagoon would present a substantial health risk; it needs to be protected.
- **Evacuation Center** – One of the biggest concerns in Shishmaref is having a safe place to be during storms. The school and church serve as evacuation shelters; however, they may not be large enough to house everyone. They may also be impacted during extreme storms. The church also does not have running water, emergency supplies, and other necessities, which limits its

usefulness as an emergency shelter. Residents need an evacuation center so they have a safe place to use during and after a storm or other emergency.

- **Coastal Flooding Analysis** – A coastal flooding analysis will identify the likelihood and severity of coastal flooding in Shishmaref. The results of the analysis will help Shishmaref with future planning efforts, studies, and projects.
- **Seawall – Phases 3 and 4** – The remaining phases of the seawall need to be constructed to protect the northern edge and southwest portion of Shishmaref.
- **Improved Housing** – Access to safe, quality, and affordable housing is vital for any community. Community residents have expressed a need to improve the housing in Shishmaref to address overcrowding, energy efficiency, affordability, and poor structural conditions.
- **Traditional Knowledge** – Alaska Natives have a unique understanding of the connections between people and their environment. Shishmaref should work with its partner agencies to ensure that traditional knowledge is not discounted. Rather, Shishmaref needs to encourage the blending of traditional knowledge and western science so that all organizations can develop a better understanding of climate change and community impacts.
- **Leadership Development** – Leaders must have the foresight to see potential challenges, plan for the future, and be involved in decision-making processes on behalf of the community. Shishmaref has expressed the need for more leadership development opportunities to ensure future community leaders have the necessary skills to work with community residents, government agencies, and others to implement their vision of a resilient Shishmaref.
- **Improve Government-to-Government Relations** – Improving government-to-government relations will help elicit trust among different government levels—tribal council, city, regional, and state—as well as various state agencies. Continued interaction and correspondence will help ensure that everyone is on the same page with the same ideas, and no relationships are destroyed through the process.

Each critical action is described in additional detail in the SMP.

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3 Shishmaref's Strategic Management Plan

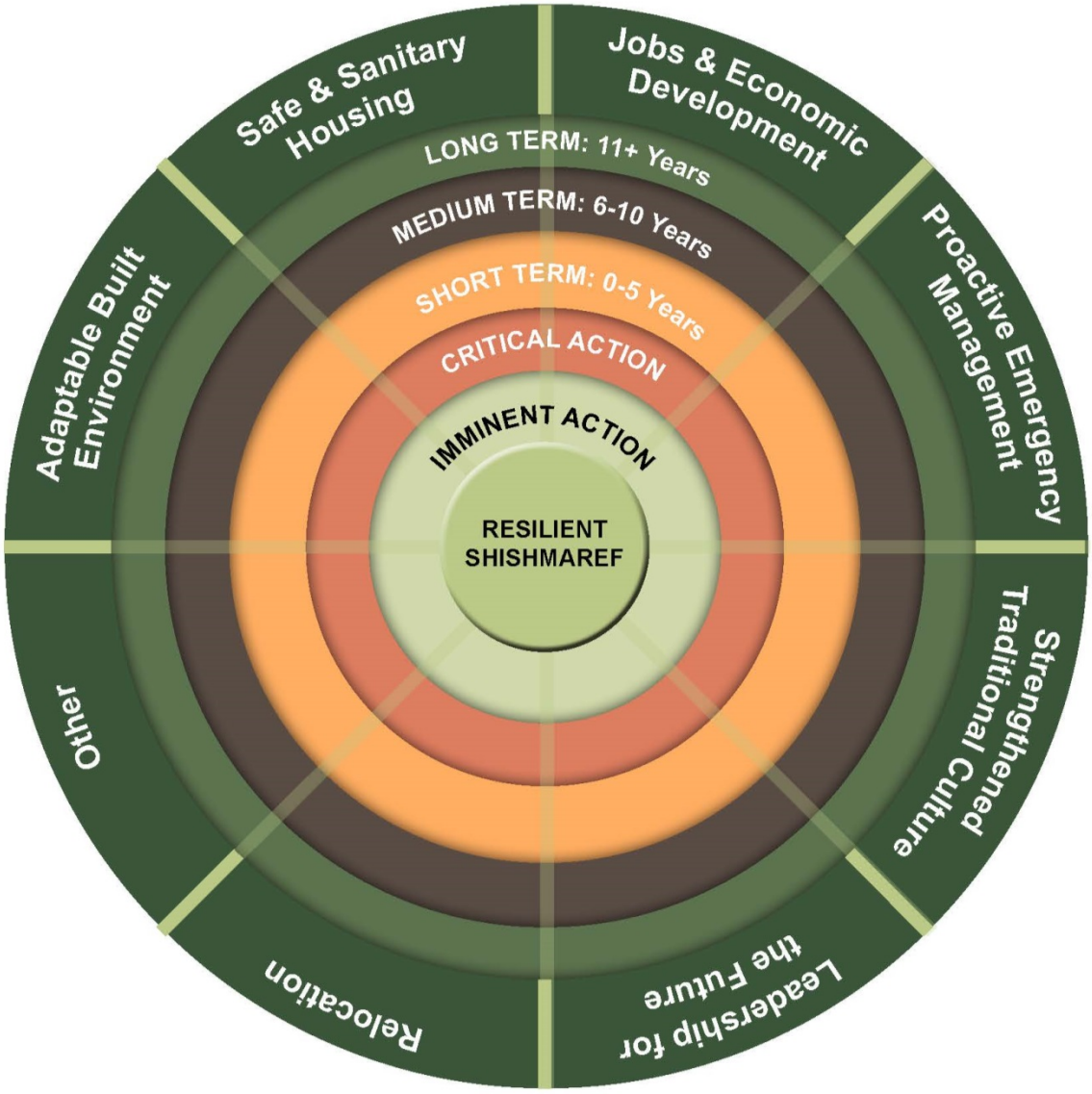
Shishmaref's SMP is organized by strategic focus area. Within each strategic focus area, imminent, critical action items are identified first, followed by short-, medium-, and long-term action items (see Figure 4).

For each action item, the following details were identified:

- **Responsible Party** – Which agency or organization has the primary responsibility for championing the action?
- **Potential Partners/Coordination** – What entities may be willing to partner with the responsible party and how can the partnership be coordinated?
- **Timeframe for Implementation** – When is the action item needed?
- **Estimated Cost** – What is the planning level cost estimate (when available)?
- **Current Status** – What is the current status of the project?
- **Reference** – What is the source of the action item, if it originated from another community plan?

For critical actions, potential funding sources have been identified. Appendix E contains additional funding sources that could be used to implement the SMP. It is important to remember that funding levels can vary year to year and funding sources can change over time. It is also important for Shishmaref to regularly review the SMP in light of funding changes and changing needs to ensure the plan remains relevant.

Figure 4. Strategic Management Plan Overview



As the community makes progress on current action items, they should update the SMP to remove completed strategic action items and add new ones. That way, the plan remains current and useful. The SMP is always a work in progress. It should be kept visible and revised periodically to meet changing community needs.

These action items have been identified through the Background Planning Report and the first two Interagency Working Group Meetings. It is important to note that the action items identified in this SMP are not intended to serve as a checklist. That is, completing the items on the list does not automatically mean Shishmaref is a resilient community. Resilience is a process of continual improvement and plan updates are essential to keep moving down that path.

The SMP is meant to be a living document that needs to be reviewed and updated frequently in order to remain relevant. Actions will trigger other actions and opportunities to defend in place. In addition, the timelines are not meant to be a mandatory schedule. They are guidelines for future planning efforts. Implementation of actions will depend on availability of resources and community priorities.

The SMP is a living document. It is not something you can write, put on a shelf, and forget about. Keep it visible. Display it prominently. As your organization changes and grows, you will want to continually revise your plan to fit the changing needs of your group and community.

3.1 Adaptable Built Environment

Essentially, the term "built environment" refers to the structures and infrastructure built by people. Examples of the built environment include roads, schools, water systems, landfills, clinics, and government facilities. The built environmental plays an important role in the daily activities of all residents of Shishmaref.

There are strong ties between a community's built environment and its resiliency. Where we build, what we build, and how it is built is essential to the resiliency of the built environment. For example, building in hazard-prone areas, facilities that take too much money to operate, and buildings that cannot withstand high winds show how a community is more vulnerable because of decisions regarding the built environment. Infrastructure that is kept in good condition often reduces operating costs. In addition, Shishmaref needs its infrastructure to be functional and operational during an emergency, as this will allow the community to respond, recover, and bounce back better from an emergency.

The main strategies for Shishmaref to have an adaptable built environment are:

- Reliable and affordable infrastructure
- Strong, safe, and healthy environment
- Responsible growth
- Strategic, collaborative partnerships

3.1.1 CRITICAL ACTION – Water and Sewer Upgrades

Based on community needs, three priority water and sewer upgrades have been identified. They are improved delivery of drinking water and sewage disposal services, increased water supply, and protection of the sewage lagoon. These are discussed in more detail below.

3.1.1.1 Improve Delivery of Drinking Water and Sewage Disposal Services

Rural communities throughout Alaska face unique challenges to addressing safe sanitation. Many homes in Shishmaref do not have access to running water and flush toilets. The difficulty in implementing adequate waste disposal system stems from the harsh climate conditions. Permafrost keeps the ground frozen for the majority of the year and piped systems are expensive and may not be suitable for the climate. If piped systems are implemented, they are very expensive to operate. In many cases, communities do not have the financial resources to keep the system functioning.

As a result, Shishmaref residents haul water from the water treatment plant and washeteria to their homes for drinking, cooking, and other household purposes. Water is often stored in buckets that are not made from food-grade plastic. Water stored in this manner is also at risk for contamination. Alternatively, residents purchase bottled water. Bottled water has to be flown into the community, making it prohibitively expensive for most residents. Due to the effort and cost associated with clean water, residents often try to conserve its use. In general, approximately 15 gallons of water per person per day is needed to remain clean and healthy (Estus 2015a, 2015b). In

CDC studies show Alaskans without plumbing get invasive pneumococcal infections up to eleven times more often than other Alaskans.

communities like Shishmaref, residents use an average of 2 gallons per person per day. This water rationing often leads to health issues. For example, many households share a basin for hand washing, which makes it easier to spread viruses.

For sewage, the "honey-bucket" system is used. Plastic buckets are used as toilets, typically lined with a plastic bag and a toilet seat attached to the top. Once the container is filled, the plastic bag is closed and the bucket is transported to a waste site near the community where it is emptied. The waste may be disposed of in sloughs, beaches, rivers, tundra ponds, or sewage lagoon by way of four-wheeler or snow machine. Shishmaref does not have a truck pick-up service for waste disposal.

One of the greatest problems associated with honey buckets is the public health risk. Because of the frequent spills that occur while transporting human waste to the sewage lagoon, residents are vulnerable to sewage-related diseases such as Hepatitis A. Once spilled, sewage is easily carried throughout the community on shoes and paws of pets. Children are particularly vulnerable as they typically play outside in the community streets and are more likely to be exposed to spilled sewage.

Water and solid waste sanitation has greatly improved in rural Alaska in the last 25 years. There are ongoing construction projects in Alaska villages for piped and water services. However, Shishmaref is faced with a conundrum of addressing immediate health risks while considering relocation. The community and their partners should think of innovative ways to improve water supply and sewage disposal services to meet the immediate need, while continuing to work on a longer term solution.

Funding of sanitation improvements also remains a significant challenge. These systems are often costly to maintain. Communities often not have sufficient revenue to adequate maintain the system which in turn leads to the system needed even more significant repairs or the failure of the system. The cost to maintain the system often comes from user fees. Increasing user fees is not a realistic solution because there are not enough users to make an appreciable difference and many residents are already struggling to pay their existing bills.

3.1.1.1.1 Honey-Bucket Alternatives

A few cost-effective alternatives Shishmaref can pursue to improve its existing honey-bucket system include the twin-bucket system, the urine-diverting dry toilet system, composting toilets, and the flush tank and haul (FTH) system. These options have been proven to be successful in other villages and may provide a viable and immediate intermediate solution to honey bucket sanitation issues. Each is discussed in more detail below.

Twin-Bucket System

The twin-bucket system uses two buckets for human waste disposal. One bucket is used for urine, while the other is used to contain feces. By separating urine and feces, the twin-bucket toilet system reduces disease risks and odor, while making the contents of each bucket easier to handle. Except for conditions such as kidney infections and other sicknesses that may affect urine, it is typically sterile and can be disposed of on a day-to-day basis. The feces bucket contains more pathogens and needs to be treated properly. Treatment includes adding dry mulch after every use of the bucket to keep the feces as dry as

possible. The twin-bucket system is a step up from the single honey-bucket system because of the separation of human waste, but there is still a high chance of accidental spills of human waste occurring on the streets. There is also no direct guarantee that human excrements are properly separated as feces or urine in all cases (e.g., chronic diarrhea). However, with the separation of human waste there is less risk of disease outbreak.

Urine-Diverting Dry Toilet System

Urine-Diverting Dry Toilets (UDDTs) are widely used throughout the world and are especially popular in places where the climate is dry, sewer infrastructure is expensive, and septic tanks are difficult to install. UDDTs have been built in many developing countries and provide an alternative to pit latrines and flushing toilets. The UDDT system is similar to the twin-bucket system in that it separates human waste. Division of human excrements decreases the likelihood of disease outbreak.

UDDTs divert the urine though a draining basin, while fecal matter drops through a larger hole at the rear of the toilet. Dry mulch or matter is then placed over the feces to prevent odors. Waste can be collected in a biodegradable bag. The waste must be allowed to dry so that it can be more easily disposed of in landfill areas. A UDDT is considered more effective for places with very little water and is more affordable than a septic tank system. One of the hurdles of using a UDDT system is regular maintenance and operations (e.g., foul odors from the feces or urine vaults, handling clogged systems, or defecation in the wrong vault). Regular follow up, education, and support for UDDT projects will lead to success and community buy-in of the system.

Composting Toilet Systems

Composting toilet prototypes were first used in Alaska in the 1980s with little success. Although composting toilets were less effective in rural Alaska, technological improvements and affordability make them a viable option today. Keeping the composting chamber insulated or in a heated part of the home makes composting possible during cold months of the year. A variety of composting toilets specially made for cold climate regions are available. However, composting toilet systems are less likely to be efficient in cold weather regions, as the composting will stop if the temperature is too low. Insulating piping in unheated areas will prevent ice-blocking problems. Heating the indoor composter is an option, but additional energy is required to keep the chamber warm. Composting toilets also do not solve the problem of transporting waste or what to do with the compost during the winter. Because Shishmaref has a short summer, this also presents the problem of what to do with the composting waste, as it does not provide enough time for the compost to be reused.

Flush Tank and Hauling System

Cowater Alaska's FTH System allows communities access to running water, flush toilets, and waste disposal. FTH systems are typically installed on a community-wide basis, with numerous installations atone time. Several villages, such as Nunapitchuk and Nightmute, are completely serviced with an FTH system.

In an FTH system, the water and wastewater are stored in two holding tanks. Fresh water is delivered to the home by a water haul tank and pumped into the in-house holding tank. Water from the piped system may be used for drinking, provided a reliable water source is used, the water is transported hygienically, and the tank is cleaned regularly. The second tank, a holding tank for solid waste and sewage, is built outside the home and above ground. The holding tank is placed inside an insulated plywood box for protection. When the holding tank is full, a sewage vacuum hose is used to transfer the waste from the holding tank to the hauling tanks. These hauling tanks can be pulled by four-wheelers or snow machines to the disposal site or sewage lagoon.

3.1.1.1.2 Funding Sources

Potential funding sources for improving water and sewer services include:

- **Indian Health Service, Sanitation Facilities Construction Program** – The Indian Health Service (IHS) is responsible for providing federal health services to Alaska Natives and American Indians. The IHS is authorized to provide essential sanitation facilities as a preventive health measure. They can fund community and individual sanitation facilities, including interior plumbing for Native-owned homes. For more information: www.ihs.gov
- **EPA, Clean Water Act – Indian Set Aside** – This program provides funding to Indian tribes and Alaska Native Villages for wastewater infrastructure improvements. To be eligible for funding, community needs must be identified in the IHS Sanitation Deficiency System. Funds may be used for planning, design, and construction of wastewater collection and treatment systems. In 2015, this program funded 80 projects and had almost $29 million in funding. For more information: https://www.epa.gov/small-and-rural-wastewater-systems/clean-water-indian-set-aside-program
- **The U.S. Department of Agriculture, Rural Development (USDA, RD)** – USDA, RD has several programs available to improve water and waste disposal systems, including loan guarantees, planning grants, revolving loan funds, and technical assistance. For more information: http://www.rd.usda.gov/programs-services/programs-services-tribes
- **USDA Rural Alaska Village Grant Program –** This program helps rural villages provide drinking water and waste disposal services. This program helps communities with a dire sanitation condition such as a recurring waterborne communicable diseases or a lack of community system, requiring households to haul water and human waste from their homes. Eligible communities must have a population of 10,000 or less and have a median household income of less than 110 percent of the statewide non-metropolitan household income. The program can fund up to 75 percent of the project costs. For more information: http://www.rd.usda.gov/programs-services/grants-rural-and-native-alaskan-villages
- **Department of Agriculture Water and Waste Disposal Loan and Grant Program** – The Water and Waste Disposal Loan and Grant Program provides funding for clean and reliable drinking water systems, sanitary sewage disposal, and storm water drainage to households. Rural areas and towns with fewer than 10,000 people and tribal lands are eligible for the program. Long-term low-interest loans are available, which may be combined with grants. For more

information: http://www.rd.usda.gov/programs-services/water-waste-disposal-loan-grant-program

- **National Rural Water Association** – The Rural Water Loan Fund is a funding program specifically designed to meet small water and wastewater utilities. Eligible projects include pre-development costs for infrastructure projects, equipment replacement, system upgrades, maintenance and small capital projects, and disaster recovery. Systems must be for public entities and can service only up to 10,000 persons. Loan amounts may not exceed $100,000 or 75 percent of the total project cost. For more information: http://nrwa.org/initiatives/revolving-loan-fund/

Responsible Party: Alaska Native Tribal Health Consortium (ANTHC)
Potential Partners/Coordination: City, Native Village of Shishmaref (Tribe) Indian Reorganization Act (IRA) Council, Shishmaref Native Corporation (SNC), Village Safe Water (VSW), Alaska Department of Commerce, Community, and Economic Development (DCCED), Kawerak, Denali Commission, Bureau of Indian Affairs (BIA), Alaska Department of Environmental Conservation (ADEC), Norton Sound Health Corporation (NSHC), U.S. Environmental Protection Agency (EPA), Alaska Department of Transportation and Public Facilities (DOT&PF), Indian Health Service, USDA
Timeframe for Implementation: Critical Action
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.1.1.2 CRITICAL ACTION – Additional Water Supply

A community needs sufficient water storage to have a source of water in case of emergency, while keeping the water in safe from potential hazards. Safe water for drinking is necessary, and water tanks must be in good condition in order to keep the water clean. The water source is stored in community water tanks, but Shishmaref currently utilizes tanks that are rusty and wearing out. The water tank skins have also been damaged from historic storms in the region. The water tank does not always have enough water for personal and emergency uses, and occasionally the community has to conserve its water; thus, extra water tanks are necessary.


Water Storage Tank

Responsible Party: ANTHC
Potential Partners/Coordination: City, Tribe, SNC, VSW, DCCED, Kawerak, Denali Commission, BIA, ADEC, NSHC, EPA, DOT&PF
Timeframe for Implementation: Critical Action
Estimated Cost: To be determined
Current Status: Planned

Reference: *Shishmaref Sanitation Facilities Master Plan*

3.1.1.3 CRITICAL ACTION – Protection of Sewage Lagoon

Shishmaref's sewage lagoon is vulnerable to storm surge and erosion. The sewage lagoon is not protected by the existing rock revetment. If the sewage lagoon is breached, there would be a public health risk because a significant amount of sewage would be released into the environment. The community should work with partners to determine if protection of the sewage lagoon should be addressed as part of seawall expansion or if another solution is required.

It is likely to take several years before a protective structure can be developed. The community should work with ANTHC and other agencies to develop a plan that addresses a potential breach of the sewage lagoon.

Responsible Party: ANTHC
Potential Partners/Coordination: City, Tribe, SNC, VSW, DCCED, Kawerak, Denali Commission, BIA, ADEC, NSHC, EPA, DOT&PF
Timeframe for Implementation: Critical Action
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.1.2 Energy

3.1.2.1 Energy Audit

An energy audit assesses various energy needs and efficiencies of a building or buildings. An energy audit can include unplugging electronics in a room, low wattage lighting, window coverings that minimize cold air drafting, sinks that have no leaks, and more insulation for the house to minimize heat loss and energy output. Energy audits can be done on many buildings, including the school, health clinic, and private homes. In Shishmaref, energy audits have been completed for the water treatment plant, health clinic, and tribal office, as well as the school. Energy audits should be conducted for the remaining structures in the community.

Responsible Party: Facility operators, individuals, Alaska Housing Finance Corporation (AHFC)
Potential Partners/Coordination: U.S. Department of Energy, Alaska Energy Authority (AEA), AHFC, Cold Climate Housing Research Center (CCHRC), Rural Alaska Community Action Program, Inc. (RurAL CAP), Denali Commission, ANTHC
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Various
Current Status: New
Reference: N/A

3.1.2.2 Heat Recovery System

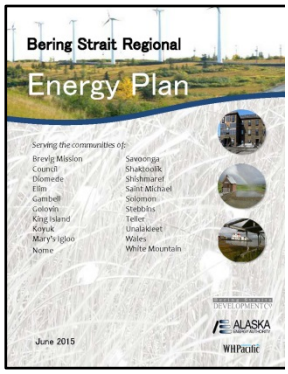
ANTHC is working with the City on waste heat recovery system. The project would recover heat from the Alaska Village Electric Cooperative (AVEC) power plant and use it to heat the City building, clinic, and

garage. It is estimated that this project should reduce fuel consumption by approximately 7,900 gallons annually. The economic benefit of this fuel reduction is approximately $39,000 per year. This project would also improve air quality and provide employment during project construction.

Responsible Party: ANTHC
Potential Partners/Coordination: City, Tribe, SNC, AVEC
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: $327,201
Current Status: Planned
Reference: *Shishmaref Sanitation Facilities Master Plan*

3.1.2.3 Reduce Energy Costs

The high cost of energy is one of the biggest issues facing rural Alaska. The *Bering Strait Regional Energy Plan* documents the current status of energy resources in the Bering Straits Region and includes a prioritized list of projects and strategies for reducing energy costs while maintaining or improving the existing level of service. Potential projects to reduce energy costs in Shishmaref include installation of a heat recovery system, completion of a surplus wind energy study for water system heat, and development of a biomass project.



Responsible Party: Facility operators, Individuals
Potential Partners/Coordination: U.S. Department of Energy, AEA, AHFC, Bering Straits Development Company, ANTHC, AVEC, City, Tribe, SNC, CCHRC
Timeframe for Implementation: Ongoing
Estimated Cost: Varies
Current Status:
Reference: *Bering Strait Regional Energy Plan*

3.1.2.4 Implement Results of Pump House Energy Audit

An energy audit was done for the Shishmaref Pump House by ANTHC in spring 2015. By following audit recommendations, the community can potentially save money spent on fuel oil and electricity that keep the local pump house running. The audit recommended several measures to the community, such as implementing a better heat recovery system and rewiring the pump to operate when the pressure switch is on. Additional efficiency steps can be found in the *Comprehensive Energy Audit for Shishmaref's Pump House*. If all recommended measures are followed, the community could potentially save more than $9,900 per year.

Responsible Party: Facility operators, City, Tribe
Potential Partners/Coordination: U.S. Department of Energy, AEA, ANTHC
Timeframe for Implementation: Mid-term (6–10 years)
Estimated Cost: $104,617
Current Status:

Reference: *Comprehensive Energy Audit for the Shishmaref Pump House*

3.1.2.5 Implement Results of Water Plant- Washeteria Energy Audit

An energy audit was done for the Shishmaref water plant and washeteria by ANTHC in spring 2015. By following audit recommendations, the community can potentially save money on fuel oil and electricity that keep the local water treatment plant running. The audit recommended several measures to the community, such as implementing controls to modulate boiler and heater temperatures and replacing all lighting with more energy efficient sources. Additional efficiency steps can be found in the *Comprehensive Energy Audit for Shishmaref's Water Plant – Washeteria*. If all recommended measures are followed, the community could potentially save $7,417 per year.

Responsible Party: Facility operators, City, Tribe
Potential Partners/Coordination: U.S. Department of Energy, AEA, ANTHC
Timeframe for Implementation: Short term (0–5years)
Estimated Cost: $21,570
Current Status:
Reference: *Comprehensive Energy Audit for the Shishmaref Water Plant – Washeteria*

3.1.2.6 Implement Results of Health Clinic Energy Audit

An energy audit was completed for the Shishmaref Clinic in January 2014. By following audit recommendations, the Clinic may be able to reduce its energy costs. The audit recommendations include adding insulation in the Clinic attic, air sealing, and replacing the existing exterior door. If all recommended energy efficiency measures are implemented, the Clinic could potentially save $6,242 per year.

Responsible Party: NSHC
Potential Partners/Coordination: City, Tribe, SNC, U.S. Department of Energy, AEA, ANTHC, DCCED
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: $21,570
Current Status: New
Reference: *Investment Grade Energy Audit: Shishmaref Health Clinic*

3.1.3 Fuel Tank Assessment

A community needs sufficient fuel storage because fuel tanks contain flammable liquids that may be dangerous, and a good storage tank is necessary to keep the community safe from potential hazards or accidents. Tanks also must have adequate fuel set aside for emergency purposes.

Responsible Party: AVEC
Potential Partners/Coordination: City, Tribe, SNC, DCCED, ANTHC, USCG
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.1.3.1 Replace Fuel Tanks (Depending on Outcome of Assessment)

A community needs sufficient fuel storage for many reasons. A tank in good repair is necessary to keep the community safe from potential hazards or accidents. The tank also needs to have sufficient holding capacity to meet community needs. Typically, fuel is shipped to Shishmaref only once a year. The community needs to have enough fuel to meet their daily needs as well as an emergency supply.

Responsible Party: AVEC
Potential Partners/Coordination: USCG, City, Tribe, SNC, EPA
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.1.3.2 Wind Feasibility Study

A wind feasibility study looks at the possibilities of a proposed wind project, and whether completing the project is a viable option. The wind feasibility study looks at the strengths and weaknesses of harboring wind power for energy purposes and where potential sites could be located, depending on available land area, exposure to the wind, existing land uses, and proximity to local residents. This feasibility study would help the local community find energy alternatives to fuel that is freighted in.

Responsible Party: AEA
Potential Partners/Coordination: USACE, Bering Strait Development Corporation, City, Tribe, SNC
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: $50,000–$150,000
Current Status: New
Reference: N/A

3.1.4 Water/Wastewater

3.1.4.1 Water Source Protection Ordinance

A water source protection ordinance is legislation or a ruling applied by the local authorities to protect the water sources within the village's boundaries. The ordinance should outline practices and activities that should be followed by community residents to prevent pollution of ground water and streams. For example, the ordinance could limit refueling of an all-terrain vehicle (ATV) within 100 feet of the water source to reduce the potential impact from a fuel spill, or prohibit any major traffic or garbage dumping near the water site. An ordinance should be written protecting the catch basin on the east side of the island, the town site's primary water source. This water source is being threatened by the erosion occurring south of the village, which could result in contamination of the fresh water source with ocean water.

Responsible Party: City and Tribe
Potential Partners/Coordination: EPA, ADEC, VSW, SNC
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Under $10,000

Current Status: New
Reference: N/A

3.1.4.2 Rainwater Capture and Reuse Program

Rain water capture and reuse can help alleviate the stress put on the community's water supply. Under this program, community residents would collect rainwater and use it instead of piped water for certain activities such as watering plants or dust suppression. Benefits of using rainwater include saving the water in the storage tanks for consumption purposes and saving the community money by having to treat less water.

It is important to note that in general, rainwater should not be used for drinking or cooking purposes. If rainwater is going to be used for drinking or cooking purposes, the water catchment system needs to be designed in such a way that the water does not come into contact with materials that could contaminate the water. Residents also need to be educated regarding the safe use of rainwater for drinking or cooking purposes.

Responsible Party: Individuals
Potential Partners/Coordination: City, Tribe, CCHRC, VSW, EPA
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Under $10,000
Current Status: New
Reference: N/A

3.1.5 Honey-Bucket Ordinance

Honey buckets are the most common types of toilets available in rural Alaska, especially in places where installing running water can be difficult and expensive. Waste from honey buckets is meant to be hauled and thrown out properly, away from the streets and homes. An ordinance is a local law to which residents must adhere. Passing a local honey-bucket ordinance that prohibits the dumping of honey-bucket waste except in designated locations would encourage proper honey-bucket disposal practices. People caught violating the ordinance would be subject to a fine or community service.


Honey-bucket Storage

In addition to the ordinance, there should be community education explaining the importance of proper waste disposal. In addition, the community should develop a way to assist residents who may dispose of waste improperly due to physical inability to transport waste to a disposal site or lack of a vehicle to transport the waste.

Responsible Party: Individual, Families
Potential Partners/Coordination: City and Tribe
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Under $10,000

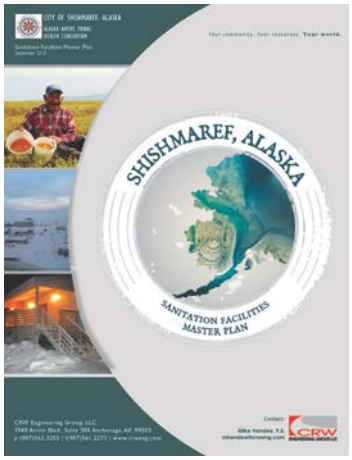
Current Status: New
Reference: N/A

3.1.6 Washeteria Expansion

The community wants to expand the washeteria. The washeteria is one of a few facilities in Shishmaref that has piped water and sewer service. The expansion should consider how the community will address additional wastewater problems and increase the amount of water used. Will there be an increase in the price for using the washeteria? Will the washeteria expansion occur in the new relocation site or in the existing village site? How many people can the washeteria accommodate?

Responsible Party: City and Tribe
Potential Partners/Coordination:
Timeframe for Implementation: Medium term (6–10 years)
Estimated Cost: $1.4 million
Current Status: Planned
Reference: *Shishmaref Sanitation Facilities Master Plan*

3.1.7 Implement Sanitation Master Plan Recommendations



The *Shishmaref Sanitation Master Plan* includes a series of 26 recommended sanitation improvements that should be implemented by 2030. ANTHC is currently implementing the raw water transmission line, washeteria expansion, and reservoir improvements. ANTHC and the community should continue working on the remaining recommendations.

Responsible Party: ANTHC
Potential Partners/Coordination: City, Tribe, SNC
Timeframe for Implementation: Medium and long term (5+ years)
Estimated Cost: $8.6 million
Current Status: In progress
Reference: *Shishmaref Sanitation Facilities Master Plan*

3.1.7.1 Update Sanitation Master Plan

The *Shishmaref Sanitation Facilities Master Plan* was completed in September 2010. The plan should be updated to reflect the recommended projects that have been completed and to reflect changing community needs.

Responsible Party: ANTHC
Potential Partners/Coordination: City, Tribe, SNC
Timeframe for Implementation: Medium term (6–10 years)
Estimated Cost: $100,000–$300,000
Current Status: New
Reference: *Shishmaref Sanitation Facilities Master Plan*

3.1.8 Transportation

3.1.8.1 Update Long Range Transportation Plan

A long range transportation plan documents the existing transportation system and guides future transportation investments. The City is responsible for maintaining the roads within the boundaries of the municipality, but the DOT&PF holds responsibility for maintaining the road to the airport runway. The Native Village of Shishmaref IRA Council is responsible for any future road projects constructed under the Indian Reservation Roads program. The transportation plan update prioritizes the building of several roads, including an emergency response road to the Foothills, 13 miles south of the community, which has a road and gravel source. The Native Village of Shishmaref and City have developed an updated list of inventory roads that the community feels are needed over the next 20 years. Updating plans for road improvements will increase employment and enhance public safety in the community.

Responsible Party: Kawerak
Potential Partners/Coordination: Alaska DOT&PF, City, Tribe, Federal Aviation Administration (FAA), BIA, SNC, Denali Commission
Timeframe for Implementation: Medium term (5–10 years)
Estimated Cost: Under $250,000
Current Status: New
Reference: *Shishmaref Long Range Transportation Plan*

3.1.9 Construct Community Streets with Dust Control Surfacing

Construct the community streets within the existing community (including access route to proposed boat harbor) with dust control surfacing.

Responsible Party: City, Tribe
Potential Partners/Coordination: Kawerak, DOT&PF, DCCED, NSHC
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: $8,000,000
Current Status: Planning
Reference: *Shishmaref Long Range Transportation Plan*

3.1.10 Construct Barge Landing and Boat Harbor Facility

Construct a barge landing and boat harbor facility at the existing town site.

Responsible Party: City, Tribe
Potential Partners/Coordination: SNC, DOT&PF, USACE, Kawerak
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: $7,000,000
Current Status: Planning
Reference: *Shishmaref Long Range Transportation Plan*

3.1.10.1 Dust Suppression Program

Large amounts of dust can be created from construction activity. Dust can be kicked up by four-wheelers traveling around town during the summer months or on the roads leading out of town. Dust poses a health threat, especially for children, causing problems such as asthma. Dust mites can also flourish and cause allergies and other health problems for humans. A dust suppression program improves visibility and road safety, and provides cleaner air and homes. Implementing a program would reduce dust-related risks such as major allergy reactions, pneumonia, and asthma attacks. Some solutions include watering roads regularly prior to conduction and during and after earth-moving operations, establishing vegetation right after the process, sweeping roads or water flushing, washing wheels after construction, and staying on established routes during construction.

Responsible Party: City and Tribe
Potential Partners/Coordination: ADEC Division of Air Quality, Alaska Office of Rural Health, EPA, BIA, FAA, DOT&PF, ANTHC, SNC, NSHC
Timeframe for Implementation: Medium term (6–10 years)
Estimated Cost: Varies
Current Status: New
Reference: *Shishmaref Local Economic Development Plan 2013-2018*

3.1.10.2 Winter Travel Improvements

Provide route staking, shelter cabins, navigational upgrades, and signage to the *2007 Long-Range Transportation Plan* inventory routes to improve safety during winter travel, reduce disorientation, and assist in rescue operations.

Responsible Party: City and Tribe
Potential Partners/Coordination: DOT&PF, Kawerak, BIA, SNC
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: Approximately $100,000 per mile
Current Status: Planned
Reference: *Shishmaref Long Range Transportation Plan*

3.1.11 Improve Winter Travel

Provide route staking, shelter cabins, navigational upgrades, and signage of inventory routes to improve safety during winter travel, prevent disorientation, and assist in rescue operations.

Responsible Party: City, Tribe
Potential Partners/Coordination: DOT&PF, Kawerak
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: $100,000 per mile of road to the staked
Current Status: Planned
Reference: *Shishmaref Long Range Transportation Plan*

3.1.12 Install Automatic Identification System

Provide route staking, shelter cabins, navigational upgrades, and signage of inventory routes to improve safety during winter travel, prevent disorientation, and assist in rescue operations.

Responsible Party: City, Tribe
Potential Partners/Coordination: DOT&PF, Kawerak
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: Unknown
Current Status: Planned
Reference: *Shishmaref Long Range Transportation Plan*

3.1.13 Additional Snow Removal Equipment

The community needs to have additional snow removal equipment to help with the snow removal process in the City. The community would like the additional equipment because it expedites the process of clearing roads and other necessary thoroughfares, such as the road leading to the school, which may be needed by children walking to school.

Responsible Party: City, Tribe
Potential Partners/Coordination:
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Unknown
Current Status: Planned
Reference: *Shishmaref Local Economic Development Plan 2013-2018*

3.1.14 Airport Improvements

The airport is vulnerable to erosion because it is not currently protected by a sea wall. The community needs to build a sea wall in order to maintain the effectiveness of the airport runway. DOT&PF is currently developing an airport master plan based on the existing and potential relocation sites.

Responsible Party: DOT&PF
Potential Partners/Coordination: City, Tribe, SNC, Kawerak
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Unknown
Current Status: Planned
Reference: *Shishmaref Local Economic Development Plan 2013-2018*

3.1.15 Street Lighting

Street lighting is important in cities and neighborhoods because it improves visibility, increases safety, and prevents crime. The community currently does not have adequate street lighting.

Responsible Party: City, Tribe
Potential Partners/Coordination:
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: $10,000 per street light

Current Status: Planned
Reference: *Shishmaref Local Economic Development Plan 2013-2018*

3.1.15.1 Airport Shelter

Provide a shelter at the airport so people waiting for flights do not have to wait outdoors.

Responsible Party: DOT&PF
Potential Partners/Coordination: Kawerak, City, Tribe, SNC, FAA
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: Unknown
Current Status: New
Reference: *Shishmaref Local Economic Development Plan 2013-2018*

3.1.15.2 Road to Gravel Source (Ear Mountain Road)

Frequently, one of the most expensive components of any construction project in rural Alaska is gravel. Ear Mountain, approximately 25 miles away from Shishmaref, has been identified as a gravel source. According to a 2009 DOT&PF reconnaissance study, Ear Mountain, as a material source, has the potential to provide an estimated 100 million cubic yards of durable porphyritic granite. This material would be extremely beneficial for future community development activities.

Currently, there is no access to the gravel source on Ear Mountain. A road has been studied by DOT&PF and a road corridor has been identified. However, in order to construct a road on this route, a permanent road easement across the Bering Heritage Land Bridge National Preserve (BHLBNP) would be required. Obtaining an easement requires action by the federal government to amend the Alaska Native Claims Settlement Act. As of June 2016, the Alaska Native Claims Settlement Improvement Act of 2016 was before Congress to approve a 300-foot easement across the BHLBNP to allow a road to be built between Shishmaref and Ear Mountain.

The Bering Heritage Land Bridge National Preserve one of the most remote national park units and is located approximately 15 miles south of Shishmaref. The Preserve is a remnant of a land bridge that connected North American and Asia more than 13,000 years ago. Archeologists agree that humans used this bridge to travel from Asia and populate the Americas.

Responsible Party: City, Tribe
Potential Partners/Coordination: DOT&PF, Kawerak, SNC, FAA, National Park Service, DCCED, Congress, Federal Highway Administration, USACE, U.S. Fish and Wildlife Service (USFWS), ADF&G, EPA
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: Unknown
Current Status: New
Reference: N/A

3.1.16 Education

3.1.16.1 School Bus

Currently, students walk to or get dropped off at school via snow machine or ATV. Community residents have indicated that a school bus or similar vehicle is needed to transport students during the winter, when students have to travel in the dark and in poor weather conditions. Residents were also concerned about the threat of bears and wolves; they are not always visible in the winter. Through an organized pick-up/drop-off service, students would also get to school more promptly and arrive safely.

Responsible Party: City and Tribe
Potential Partners/Coordination: Kawerak, City, Tribe, SNC, DOT&PF, Bering Strait School District (BSSD)
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: Unknown
Current Status: New
Reference: N/A

Shishmaref School

3.1.17 School Upgrades

The school was renovated in 2002 (Tetra Tech 2004), but it may need to be enlarged to accommodate a growing student population. Additional rooms may be needed in order to accommodate larger class sizes. More lighting along the road and transportation support for the school may help students travel safely between school and home.

Responsible Party: BSSD
Potential Partners/Coordination: City, Tribe, SNC
Timeframe for Implementation: Medium term (6–10 years)
Estimated Cost: Unknown
Current Status: New
Reference: N/A

3.1.18 Health

3.1.19 Health Clinic Expansion

The Katherine Miksruaq Olanna Memorial Clinic provides immediate health and medical care for the community of Shishmaref. The medical staff includes physicians, physician assistants, and nurse practitioners. However, the clinic does not have sufficient space and needs to increase capacity in order to serve the community. A planned expansion was scheduled for construction in summer 2013, but has not occurred. The clinic needs to expand to accommodate two new rooms and a morgue. What other amenities does the clinic need? Where will funding come from?

Responsible Party: NSHC

Potential Partners/Coordination: Alaska Office of Rural Health, Denali Commission, Kawerak, SNC, City, and Tribe
Timeframe for Implementation: Medium term (6–10 years)
Estimated Cost: Unknown
Current Status: Planned
Reference: *Shishmaref Local Economic Development Plan 2013-2018*

3.1.20 Other

3.1.20.1 New Landfill

The existing landfill is too close to the airport and does not meet EPA requirements. The current erosion occurring near the landfill can pose a serious threat to the village. The landfill is in the process of being relocated to a better location that will limit its harm to the community while allowing it to serve its purpose. The community should have meetings to discuss the new site location for the land fill.

Trash Not Disposed of in Landfill

The community should also consider ways to reduce the waste stream to reduce the amount of materials entering the landfill.

Responsible Party: City and Tribe
Potential Partners/Coordination: ADEC, DOT&PF, SNC, FAA, AVEC, EPA
Timeframe for Implementation: Medium term (6–10 years)
Reference: *Shishmaref Local Economic Development Plan 2013-2018*

3.1.20.2 Visitor Accommodations

Shishmaref receives a number of regular visitors. These visitors include representatives from government agencies, construction workers, family members, and others. The community has little very space to accommodate overnight visitors. The community has expressed a desire to have additional visitor accommodations.

Responsible Party: City, Tribe
Potential Partners/Coordination: SNC, Kawerak, DCCED, ANTHC, EPA
Timeframe for Implementation: Medium term (6–10 years)
Estimated Cost: Unknown
Current Status: New
Reference: *Shishmaref Local Economic Development Plan 2013-2018*

3.1.20.3 Multi-Purpose Building

The community of Shishmaref has long expressed need for a multi-purpose building. The multi-purpose building can provide for many different community needs. The facility would provide a public kitchen,

lunch room for elders, an Elders and Youth facility, guest lodging, and public computers. According to the *Shishmaref Economic Development Plan 2013–2018*, the multi-purpose building is a main priority. However, the community has had to face many challenges to the project development process, including finding a central location in the village to locate the building and funding initial project-startup costs. The community must also undergo the land use and building permitting process in order to build the multi-purpose building.

Responsible Party: City and Tribe
Potential Partners/Coordination: Alaska Office of Rural Health, Denali Commission, Kawerak, SNC, NSHC, DOT&PF, Division of Homeland Security and Emergency Management (DHS&EM), VSW, ANTHC, AVEC, EPA
Timeframe for Implementation: Medium term (6–10 years)
Estimated Cost: Unknown
Current Status: New
Reference: N/A

3.1.20.4 Arts and Crafts Building

Arts and crafts provide an opportunity for the community to encourage creative thinking. Crafting is also a form of entertainment and an educational activity. Art can provide many benefits to a community. In Shishmaref, arts and crafts can increase mental activity for the elderly and alleviate problems of alcoholism and drugs. An arts and crafts building is also an opportunity to share local and traditional art and knowledge. Making tools, watercraft, clothing, and drums are potential art projects. These projects can be a community-building effort in which youth and elders work together and share local traditional knowledge. An arts and craft building would provide a place for the community to showcase their unique art to each other and to visitors while also providing Shishmaref a sense of pride and accomplishment.

Responsible Party: City and Tribe
Potential Partners/Coordination: Kawerak, SNC, EPA, Department of Housing and Urban Development (HUD), BSSD
Timeframe for Implementation: Medium term (6–10 years)
Estimated Cost: Unknown
Current Status: New
Reference: N/A

3.1.20.5 Youth Center

The community has indicated that they would like a youth center to give younger residents a safe place to socialize and hang out.

Responsible Party: City and Tribe
Potential Partners/Coordination: Kawerak, SNC, BSSD, DCCED
Timeframe for Implementation: Medium term (6–10 years)
Estimated Cost: Unknown

Current Status: New
Reference: N/A

3.1.20.6 Acquire Additional Heavy Equipment

The community needs heavy equipment to assist with community infrastructure projects. An inventory of heavy equipment should be done to identify specific equipment to be acquired. If heavy equipment is acquired, a community shop or storage is also needed to protect the equipment from the weather and to provide a space to conduct maintenance.

Responsible Party: City, Tribe
Potential Partners/Coordination: SNC, DOT, VSW, ANTHC, EPA, Kawerak, USACE, BSSD, AVEC, Bering Strait Native Corporation
Timeframe for Implementation: Medium term (6–10 years)
Estimated Cost: Unknown
Current Status: New
Reference: *Shishmaref Local Economic Development Plan 2013-2018*

3.2 Safe and Sanitary Housing

Housing and housing affordability are major challenges in rural Alaska. Housing is expensive because of Shishmaref's remote location and the high cost of transporting construction materials. Shishmaref, like many other communities, does not have enough housing to meet the community's need. Many of the existing housing units are overcrowded and need major repairs.

The lack of affordable housing can have a negative impact on a community. Without sufficient and affordable housing, residents may choose to leave Shishmaref to seek better housing elsewhere.

To address housing for a resilient Shishmaref, there are several factors to consider:

- **Local environmental conditions** – A house that is not designed for cold weather, high winds, or other such conditions is harder to maintain and more likely to fall into disrepair. Housing design needs to be appropriate for the local conditions and include features such as extra insulation, adjustable foundations, self-contained sewer systems, and solar energy.
- **Energy costs** – Homes should be built using techniques and materials that reduce energy costs.
- **Location** –New homes should be located in less vulnerable locations when possible.
- **Affordability** –Homes should be affordable to construct and maintain.

Key housing-related strategies for increasing Shishmaref's resiliency include:

- Affordable and diverse housing options
- Safe and healthy housing
- Accessible housing options

3.2.1 CRITICAL ACTION – Housing Improvements

Access to safe, quality, and affordable housing is vital for any community. Community residents have expressed a need to improve the housing in Shishmaref for a variety of reasons, including:

- **Overcrowding** – Studies have shown that overcrowding can have a negative impact on people and their quality of life. People who live in overcrowded conditions often have higher levels of anxiety, stress, and depression. The quality of interpersonal relationships suffers because of a lack of privacy. Children lack enough space to play and study. There is a lack of storage space for subsistence food and emergency supplies.
- **Inefficient and expensive energy use** – Housing units in rural Alaska use more energy than housing units in other areas to heat their homes. This is partially due to the colder conditions found in many rural communities, but it is also because most homes are not energy efficient. In

addition, many homes rely on fuel oil, which is often more expensive than other sources of electricity.

- **Affordability** – Housing costs in Shishmaref are high and households often have to spend more than the federally suggested maximum of 30 percent of their total income on housing costs.
- **Poor conditions** – Many homes in Shishmaref have mold and mildew problems due to poor ventilation and air circulation. This results in poor indoor air quality-related problems, which in turn can lead to respiratory health issues. Building structures are often exposed to high humidity and condensation, which can lead to the deterioration of the structure. This is often worse in homes that do not have washing facilities and hang wet clothes inside to dry.

Making housing improvements in rural Alaska is often challenging due to the lack of available construction materials, high cost of materials, and availability of skilled workers such as electricians and plumbers.

Poor housing conditions such as structural problems, chronic dampness, and poor ventilation can cause injury and illness, and increase energy consumption for the home. Health benefits of having an energy-efficient and safe home can reduce the potential for medical problems and bills associated with illnesses and other health impacts associated with poor housing conditions.

Potential Funding Sources

Potential funding sources for housing improvement include:

- **Bering Straits Regional Housing Authority Housing Preservation Grant Program** – The housing preservation grant is a forgivable loan for up to $30,000 to allow low-income, Alaska Native homeowners the opportunity to perform repairs to their homes. Eligibility guidelines include proof that the applicant is American Indian or Alaska Native, proof of low-income status, proof of home ownership, and ability to provide a detailed description of improvements needed with an estimate of project costs. For more information: http://www.bsrha.org/#!housing-preservation-grant/c28u
- **United States Department of Agriculture Single Family Housing Repair Loans and Grants** – Also known as the Section 504 Home Repair Program, this program provides loans to very low-income homeowners to repair, improve, or modernize their homes, or grants to elderly very low-income homeowners to remove health and safety hazards. A maximum loan is $20,000 with a 1 percent interest rate. The maximum grant is $7,500 and must be repaid if the property is sold in less than 3 years. Home loans are available year-round as long as funding is available, and applications are processed in a rolling basis. For more information: http://www.rd.usda.gov/programs-services/single-family-housing-repair-loans-grants
- **Alaska Housing Finance Corporation Weatherization at No Cost Program** – Individuals who meat income limits can apply for the weatherization program which provides services at no cost to qualified applicants. Residential dwellings can participate in one of the following AHFC programs: Home Energy Rebate, New Home Rebate, or Weatherization program. For more information: https://www.ahfc.us/efficiency/energy-programs/weatherization/

- **RurAL CAP Weatherization Program** – RurAL CAP provides a number of services, including determining causes of household drafts; providing cost reducing energy tips, home improvements for winter months, including heat, safety, and health related improvements, and proper ventilation to improve air quality; testing and tuning heating systems; air-sealing homes; sealing heating ducts; and installing smoke and carbon monoxide detectors in houses. For more information: http://ruralcap.com/weatherization/rural-weatherization/
- **Department of Housing and Urban Development Section 184 of the Indian Home Loan Guarantee Program** – The Section 184 Indian Home Loan Guarantee Program is a home mortgage specifically designed for American Indian and Alaska Native families. Loans can be used for new construction, rehabilitation, purchasing an existing home, or refinancing. To help increase Native access to financing, Section 184 home mortgage loans are guaranteed to Native borrowers. Maximum loan limit for 2015 in the Nome Borough was $482,000 for a single unit. For more information: http://portal.hud.gov/hudportal/HUD?src=/program_offices/public_indian_housing/ih/homeownership/184
- **HUD's Indian Community Development Block Grant (ICDBG) Mold Remediation and Prevention** – The ICDBG provides funding for mold remediation for Native American and Alaska Native organizations and tribal governments. The program awards 16 grants with a maximum of $800,000 for mold remediation and prevention in and on housing units owned and operated by tribes and tribally designated housing entities. For more information: http://www.federalgrants.com/Community-Development-Block-Grant-ICDBG-Program-for-Indian-Tribes-and-Alaska-Native-Villages-Mold-Remediation-and-Prevention-50827.html

  HUD's ICDBGs are used for two purposes: single purpose and imminent threat. Single purpose grants are competitively awarded to provide funds for activities designed to meet a specific community development need and must primarily benefit low- or moderate-income families. Imminent threat grants are awarded if the funding will provide a solution to an urgent problem that requires immediate action or if an emergency will exist if the problem is not addressed. The grants provide a solution to urgent problems that were not evident in time to apply for ICDBG single-purpose funding.
- **BIA's Housing Improvement Program (HIP)** – The HIP is a home repair, renovation, replacement, and new housing grant program for American Indians and Alaska Native individuals and families who have no immediate resource for standard housing. HIP is a secondary, safety-net housing program that seeks to eliminate substandard housing and homelessness by helping those who need it most to obtain decent, safe, and sanitary housing for themselves and their families. HIP is administered by BIA and federally recognized Indian tribes. For more information: http://www.bia.gov/WhoWeAre/BIA/OIS/HumanServices/HousingImprovementProgram/
- **ANTHC's Air and Healthy Homes Program** – The Air and Healthy Homes Program works with Tribal partners to address air quality and healthy homes issues in their communities. The Tribal Air Quality program works with communities to increase public awareness of air quality issues

and to enhance tribal capacity to address local air quality concerns. The program offers mini grants to fund locally managed air quality projects and provides technical assistance and support in the development and implementation of air quality projects. The Healthy Homes program provides education and tools to help residents improve their home environment by improving indoor air quality and reducing indoor air pollutants. In collaboration with local environmental departments, the Healthy Homes program also provides technical support, education and training, and air monitoring equipment. For more information: http://anthc.org/what-we-do/community-environment-and-health/healthy-homes/

- **EPA's Tribal Air Grants** – The EPA is committed to working with tribes to develop and implement Clean Air Act (CAA) programs. One of EPA's primary tools in this effort is to award CAA grants in order to help build tribal knowledge and increase tribe's capacity to manage air quality issues. For more information: https://www.epa.gov/tribal-air/tribal-air-grants-framework-menu-options

Responsible Party: Individuals, City, Tribe
Potential Partners/Coordination: SNC, Bering Straits Regional Housing Authority, AHFC, HUD, RurAL CAP, Denali Commission, EPA, CCHRC
Timeframe for Implementation: Critical Action (0–5 years)
Estimated Cost: Varies
Current Status: New
Reference: N/A

3.2.2 Housing Needs Assessment

A housing needs assessment is a study of the structural characteristics and conditions of dwellings, the demographic structure of the community, and local housing and other issues related to housing in the area. It allows a community to develop an understanding of their housing issues and their most critical local housing issues. A housing needs assessment is helpful to Shishmaref to quantify the number of additional housing units needed in the community, compile a comprehensive list of needed repairs, and identify barriers to housing assistance.

As part of the assessment, homes that need to be elevated should be identified.

Responsible Party: Individual, City, Tribe
Potential Partners/Coordination: SNC, Bering Straits Regional Housing Authority, AHFC, HUD, EPA
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost:
Current Status: New
Reference: N/A

3.2.3 Develop Housing Strategy

A strategy to improve the existing housing stock and meet future housing needs will be developed as a result of the housing needs assessment. The housing strategy will lay out a plan of how to address various issues that currently exist, determine whether the options are feasible, identify appropriate

housing types for the community, identify potential suitable locations for new housing, and identify a timeline for funding and construction. Specific issues that should be considered include ventilation systems that operate with very low maintenance and do not let cold air in, as well as ways to increase storage. Food storage is of particular importance to avoid cross-contamination and spoilage. As a short-term measure, storage sheds or a community storage facility may be an option.

The community and interested homeowners and renters should be involved in the strategy process, as this lays out the plan for housing in the village for the future. The housing strategy could be developed along with the needs assessment.

Responsible Party: City and Tribe
Potential Partners/Coordination: SNC, Bering Straits Regional Housing Authority, CCHRC, EPA
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: $100,000–$250,000
Current Status: New
Reference: N/A

3.2.4 Housing Upgrades

To address the known issues and those identified in the needs assessment and housing strategy, many existing housing units need to be upgraded. Typical improvements that are needed include improving energy efficiency, addressing mold and mildew issues to improve indoor air quality, caulk and sealing doors and windows, along with structural improvements. These upgrades are needed to ensure residents have a place to live that does not negatively impact their health.

Responsible Party: Individuals, City, Tribe
Potential Partners/Coordination: SNC, Bering Straits Regional Housing Authority, CCHRC, EPA
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Varies
Current Status: New
Reference: N/A

3.2.5 Low-Income/Elder Housing

In additional to a general need for additional housing, Shishmaref specifically identified a need for additional low-income and elder housing. High housing costs, combined with a lack of employment opportunities, means there are some residents in Shishmaref who cannot afford housing.

In addition to needing affordable housing, many elders have other special requirements. For example, they have mobility issues that prevent them from walking long distances or using stairs, they may be

unable to operate an ATV or snow machine, or they may need assistance with daily tasks. One issue of growing concern is the ability of elders to age in their village. Traditionally, they have relied on their families for any needed assistance. With more residents leaving the villages for more urbanized areas, elders may lack the support network they need in order to remain in Shishmaref.

The community needs to work together and with housing providers to identify how to accommodate low-income and elder housing in the community. Specific issues that should be addressed include the appropriate location for each type of housing, how much of each type is needed, and how to fund these projects. In addition, the community should consider how best to address low-income and elder households in the community evacuation plan, as these households may lack access to transportation, which hinders their ability to evacuate if necessary.

Responsible Party: City and Tribe
Potential Partners/Coordination: SNC, Bering Straits Regional Housing Authority, AHFC, ICDBG, HUD, CCHRC
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: Varies depending on number of housing units
Current Status: New
Reference: N/A

3.2.6 Housing Standards

The City should consider adopting housing standards to ensure that new homes are built in a way that meets community needs. For example, housing should be required to be elevated to reduce the risk of flooding. If the community elects to relocate, new housing should be built in a way that allows the house to be relocated in the future. Documented housing standards allows these needs to be communicate to other agencies and individuals wanting to build homes in Shishmaref. The standards also need to be enforced.

Responsible Party: City
Potential Partners/Coordination: Tribe, SNC, Bering Straits Regional Housing Authority, Bering Straits Native Corporation, Kawerak, AHFC, RurAL CAP, CCHRC
Timeframe for Implementation: Medium to long term (5+years)
Estimated Cost: Under $50,000
Current Status: New
Reference: N/A

3.2.7 Construct Additional Housing

Construction of additional housing would reduce the problems of overcrowding that currently persist in Shishmaref. There are not enough homes for the growing population, and thus many multi-generational family members live together. Additional housing construction would provide some jobs in the local economy, provide new, energy-efficient homes, and solve problems of overcrowding. Shishmaref should also consider alternative housing styles to the single-family home. Multi-family housing, such as

duplexes and mother-in-law suites, may be more suitable for the needs of some residents are they are better able to accommodate larger, multi-generational family units.

The City and Tribe can apply for funding opportunities from AHFC, RurAL CAP, Bering Straits Native Corporation, and Kawerak Corporation for the construction of additional housing in Shishmaref.

Responsible Party: City, Tribe, Individuals
Potential Partners/Coordination: SNC, Bering Straits Regional Housing Authority, Bering Straits Native Corporation, Kawerak, AHFC, RurAL CAP, CCHRC
Timeframe for Implementation: Medium to long term (5+years)
Estimated Cost: $300,000–$500,000 per housing unit
Current Status: Planned (limited due to available land)
Reference: N/A

3.3 Jobs and Economic Development Opportunities

Jobs and economic development are important elements of resiliency. When residents have jobs that pay enough to meet their needs, they are able to stay in their community instead of moving elsewhere for employment. Residents are able to pay for their utilities, such as electricity, water, and sewer. Utility operators can then use those funds for system maintenance and upgrades. When people have money to spend locally, there is also a positive multiplier effect that benefits others in the community.

In short, communities that are economically resilient are better able to survive an emergency, can retain residents, and have a high quality of life.

The primary employment and economic development strategies to increase resiliency in Shishmaref are:

- Residents have the skills necessary for jobs in the community.
- Economic diversity supports local businesses as well as new opportunities.
- Local residents have the right skills for jobs available in the community.
- Catalyst projects that can support local residents.

3.3.1 Community Asset Mapping

Community asset mapping is when a community looks at its assets and concentrates on internal problem-solving through local determination and creativity. This process can lead to community empowerment, as opposed to always looking at issues with a needs-based approach and relying on external services to provide for the community. Assets can include various skills, knowledge, talents, and experience of local residents, businesses, schools, churches, community organizations and associations, physical structures, and natural resources. Many residents have traditional, technical, mechanical, and practical skills that would be useful during an emergency and on a day-to-day basis. Mapping can help identify unknown talents and skills and eventually lead the community to feel more empowered and have a stronger sense of direction.

Responsible Party: City or Tribe
Potential Partners/Coordination: SNC
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Under $50,000
Current Status: New
Reference: N/A

3.3.2 Grant Writing Workshop

Grants are an important source of income for a rural community. A grant writing workshop will teach community members how to identify grant opportunities, write grant applications, follow up with grants, and understand how they can apply grants to benefit the community or themselves. Grant writing workshops can be provided by a non-profit organization or through other regional or state organizations. Shishmaref could host a workshop or send people to workshops elsewhere as funding allows. Recurring training may have to be provided, depending on staff turnover.

Responsible Party: City, Tribe
Potential Partners/Coordination: SNC, HUD, DCCED, Kawerak
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Less than $50,000 per occurrence
Current Status: New
Reference: N/A

3.3.3 Develop Economic Diversification Strategy

An economic diversification strategy looks at ways the community can be more diverse in the economies that create jobs or earn income. Shishmaref's current economy is primarily based on subsistence with part-time wages earned, but the local fishing industry is growing and also provides some income. More jobs may also be created from the development of the fish processing facility in the village. Questions to be addressed as part of the strategy include: What are some ways Shishmaref can diversify its economy? Are there locally made products that could be sold to residents or exported to other villages or communities for trading and commerce purposes? How can existing opportunities generate additional income? Examples of economic diversification strategies Shishmaref could employ are increased tourism, selling locally grown produce, and ensuring visitors know how to purchase art, jewelry, food, and other items locally.

Responsible Party: City, Tribe
Potential Partners/Coordination: Kawerak, SNC
Timeframe for Implementation: Short term (0–5 years). Strategy should be periodically reviewed and refreshed.
Estimated Cost:
Current Status: New
Reference: N/A

3.3.4 Develop Education and Training Programs

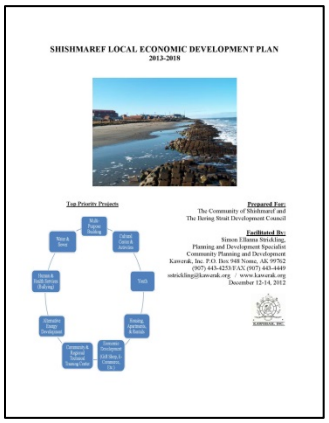
Residents may need additional education and training to be qualified for certain jobs in the community. Shishmaref should develop education and training programs to ensure their residents have the right skills and certifications to quality for meaningful employment opportunities. Shishmaref should consider bringing training opportunities to Shishmaref (through distance learning or in-person training) as well as providing opportunities to send residents elsewhere for training.

Responsible Party: City, Tribe
Potential Partners/Coordination: Kawerak, Bering Strait School District, University of Alaska
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: To be determined
Current Status: New

Reference: N/A

3.3.5 Update Local Economic Development Plan

The local economic development plan provides a community inventory of demographics, social conditions, economic conditions, and public and private services, and provides the village of Shishmaref with information on traditional resources and the planning process. The plan emphasizes the development goals for the economy and local resources and describes which capital improvement projects should be addressed. Updating the economic plan regularly will help ensure that the community keeps looking forward for more opportunities and adjusts the plan accordingly if there is a shift in perception and goals.


SHISHMAREF LOCAL ECONOMIC DEVELOPMENT PLAN
2013-2018

Responsible Party: City, Tribe, Bering Straits Development Council
Potential Partners/Coordination: Kawerak
Timeframe for Implementation: Ongoing (every 5 years)
Estimated Cost: Under $250,000
Current Status: Planning
Reference: *Shishmaref Local Economic Development Plan 2013-2018*

3.3.6 Teen Employment Strategy

Youth employment is beneficial for a community, as jobs can help teens develop their identities, have more autonomy with personal income, achieve new accomplishments, and obtain work experience while keeping youth out of trouble. This can be done by providing interesting opportunities for youth to perform outside training, summer exchange programs with nearby villages, work for the school or village council, and become acquainted with leadership positions to gain more responsibilities in the community. Local corporations and associations may also provide employment programs and opportunities for youth.

Responsible Party: City and Tribe
Potential Partners/Coordination: Bering Straits Native Corporation, Kawerak, SNC, BSSD
Timeframe for Implementation: Medium term (6–10 years). Strategy should be periodically reviewed and refreshed.
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.4 Proactive Emergency Management

Emergency management encourages safer communities with the capacity to cope with hazards. It includes all activities to build, sustain, and improve the ability to mitigate against, prepare for, respond to, and recover from disasters.

According to the Federal Emergency Management Agency (FEMA), emergency management must be:

1. **Comprehensive** – Emergency managers consider and take into account all hazards, all phases, all stakeholders, and all impacts relevant to disasters.
2. **Progressive** – Emergency managers anticipate future disasters and take preventive and preparatory measures to build disaster-resistant and disaster-resilient communities.
3. **Risk-driven** – Emergency managers use sound risk management principles (hazard identification, risk analysis, and impact analysis) in assigning priorities and resources.
4. **Integrated** – Emergency managers ensure unity of effort among all levels of government and all elements of a community.
5. **Collaborative** – Emergency managers create and sustain broad and sincere relationships among individuals and organizations to encourage trust, advocate a team atmosphere, build consensus, and facilitate communication.
6. **Coordinated** – Emergency managers synchronize the activities of all relevant stakeholders to achieve a common purpose.
7. **Flexible** – Emergency managers use creative and innovative approaches in solving disaster challenges.
8. **Professional** – Emergency managers value a science and knowledge-based approach based on education, training, experience, ethical practice, public stewardship, and continuous improvement.

Proactive emergency management means the community is planning ahead for anticipated disasters rather than just reacting should one occur. The residents of Shishmaref know they will be subjected to more coastal storms in the future. It is just a matter of when the next one will occur and how large it will be.

Key emergency management strategies for increasing Shishmaref's resiliency include:

- Planning and Preparedness
- Education and Drills
- Protective Structures

3.4.1 IMMINENT ACTION – Emergency Drills and Exercises

Emergency drills and exercises provide an opportunity to practice something associated with an emergency plan. They are an important component of emergency preparedness because they help people become familiar with what is expected of them during an emergency and help identify whether the plan meets community needs or if changes need to be made.

3.4.1.1 Exercise Methodology

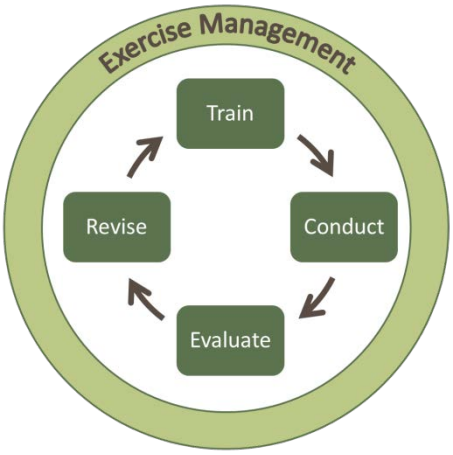
While there is great value in conducting emergency drills and exercises, there are other important components associated with a drill/exercise that allow the community to benefit the most.

The common planning methodology followed for all exercise types includes exercise program management, design, and development; and conduct, evaluation, and improvement planning applicable to management of exercise programs and execution of individual exercises—regardless of the scope or scale of the exercise (see Figure 5).

Design and Development

When designing and developing individual exercises, exercise planning team members schedule planning meetings, identify and develop exercise objectives, design the scenario, create documentation, plan exercise conduct and evaluation, and coordinate logistics. At key points in this process, the exercise planning team engages elected and appointed officials to ensure that their intent is captured and that the officials are prepared to support the exercise as necessary.

Figure 5. Emergency Drill/Exercise Cycle



Conduct

After design and development activities are finished, the exercise is ready to occur. Activities essential to conducting individual exercises include preparing for exercise play, managing exercise play, and conducting immediate exercise wrap-up activities.

Evaluation

Evaluation is an essential component of an exercise and must be considered throughout all phases of the exercise planning cycle, beginning when the exercise planning team meets to establish objectives and initiate exercise design. Effective evaluation assesses performance against exercise objectives, and identifies and documents strengths and areas for improvement relative to core capabilities.

Revision

Based on what was learned during the evaluation phase, plans, policies, and other aspects are revised to better meet community and organizational needs.

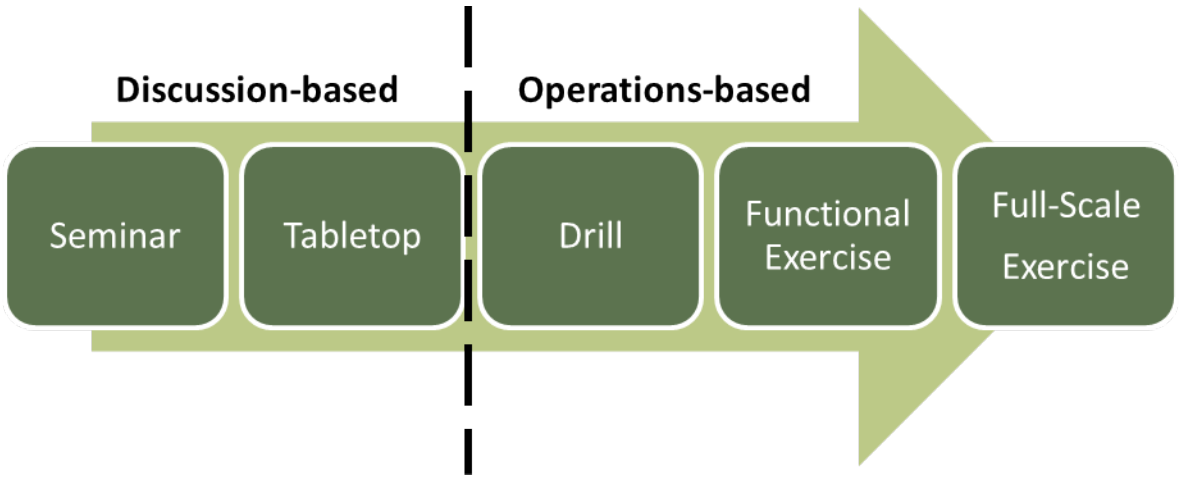
3.4.1.2 Building Block Approach

Before a drill or exercise is performed, the community needs to decide what needs to be practiced. That is, they need to decide the scope of the drill. Does the community need to practice emergency response activities? Evacuation efforts? Just one element of a plan?

While it is tempting to practice an entire plan, the community may find it easier to conduct drills in stages to keep the drill from becoming overwhelming. It is recommended that Shishmaref use a building block approach to drills and exercises.

In the building block approach, activities are progressive in nature so participants build on skills and experiences from other activities. Participants start with basic specific, lower cost, and theoretical elements and then move onto bigger, more complex, more involved realistic exercises (see Figure 6).

Figure 6. Building Block Approach to Emergency Drills and Exercises



Discussion-based activities familiarize people with current plans, policies, agreements, and procedures, or may be used to develop new plans, policies, agreements, and procedures. They can include seminars, or similar training sessions, and tabletop exercises. Seminars and other training activities are opportunities for people to learn about existing or new plans, policies, operations, and procedures. These activities are designed to increase people's knowledge in a low-stress situation and encourage participant interaction. Tabletop exercises involve emergency responders and others discussing hypothetical emergency scenarios in an informal setting. Tabletop exercises can be used to assess plans, procedures, or systems; promote an understanding of concepts; identify strengths and gaps; and achieve changes in approach to a particular situation.

Operations-based exercises are typically designed to test actual reactions to a simulated emergency, identify gaps in resources, improve individual and team performance, and include the mobilization of resources and personnel. During an operations-based exercise, participants must act out their response instead of just talking about how they would respond to mirror real events. As they are more complex, operations-based exercises typically take more time to plan and are more expensive to conduct.

Three types of operations-based exercises include:

- **Drill** – A coordinated, supervised exercise activity, normally used to test a single specific operation or function.

- **Functional Exercise** – An exercise is designed to validate and evaluate individual capabilities, multiple functions, activities within a function, or interdependent groups of functions.
- **Full-Scale Exercise** – Multi-agency, multi-jurisdictional, multi-organizational exercises that validate many facets of preparedness.

It can typically take 2–4 months to prepare for a table top exercise and up to 1 year for a full-scale exercise. The community should work with DHS&EM to develop a multi-year training and exercise plan to ensure community needs are being met.

Responsible Party: City, Tribe
Potential Partners/Coordination: DHS&EM, Kawerak, DCCED, AVEC, Village Public Safety Officer (VPSO), NSHC, BSSD, FEMA, DOT&PF, National Oceanic and Atmospheric Administration (NOAA), VSW, ANTHC
Timeframe for Implementation: Ongoing (annually)
Estimated Cost: Under $50,000
Current Status: New
Reference: N/A

Reasons Exercises Fail

- Scenarios are not tailored to the local area
- Scenarios are too complex to manage successfully
- Inadequate time is allocated for exercise
- There is no honest critique of the exercise afterwards
- Safety issues are not addressed properly
- Exercise is planned and initiated too quickly
- Some essential agencies are not included
- Results of evaluation are not implemented

3.4.2 CRITICAL ACTION – Evacuation Center

One of the biggest concerns in Shishmaref is having a safe place to be during storms. Flooding events are expected to inundate the community with 1–3 feet of water, and there is no existing location within the community that would be above the water level. An evacuation road was previously studied and was found to be impractical due to the cost, potential flooding of the evacuation road, lack of transportation for residents, and need for a shelter at the road terminus.

Recently, the community received funding to expand and reinforce the school to use it as a storm shelter. However, the school is located on the coast and is not elevated high enough, making it vulnerable to coastal storms. The school is also not large enough to house the residents during a storm.

The community has indicated that they have a critical need for an evacuation center, which would be a central point for everyone in the community to convene during an emergency. The evacuation center should be built within the community in a location away from the coastline. The structure also needs to be elevated to be out of the floodwater. The community should evaluate making the facility relocatable. However, given the lack of developable land, finding a suitable site for an evacuation center within the existing community may be a challenge. If there is no suitable site, the community should consider making improvements to an existing structure so it can serve as an evacuation center.

The evacuation center needs to be self-sufficient during an emergency. The center will need to have a generator, water supply, and sewage lagoon, as well as enough emergency supplies (e.g., food, water, emergency communication devices, medical supplies, sleeping cots, and blankets) to last for several days.

Planning for the evacuation center will need to be done with the community. Information about what type of supplies are needed, emergency food, who can open the shelter, extra keys, and alarm codes to the system is necessary to create a successful system. Who can support the creation of the center? Where will the funding come from? How will the center be utilized, aside from evacuation purposes?

Responsible Party: City, Tribe
Potential Partners/Coordination: SNC, Kawerak, Bering Straits Native Corporation, FEMA, USACE, DCCED, NSHC, BSSD, Department of Health and Social Services, VSW, ANTHC, NOAA, CCHRC, DHS&EM
Timeframe for Implementation: Critical Action
Estimated Cost: $10–$40 million
Current Status: New
Reference: N/A

Potential Evacuation Center Needs:

- Sleeping area
- Communication center
- Power/Heat
- Infirmary
- Water
- Garbage facility
- Bathroom facilities
- Emergency supplies
- Kitchen
- Dining area
- Living space
- Ventilation
- Pet area
- Access

3.4.3 CRITICAL ACTION – Coastal Flooding Analysis

A coastal flooding analysis will identify the likelihood and severity of coastal flooding in Shishmaref. As part of the analysis, historical wind, wave, and storm water level data will be used to create a model that simulates storm conditions in Shishmaref. This model will then be used to predict flooding at specific recurrence intervals. The results of the analysis will help Shishmaref with future planning efforts, studies, and projects.

Responsible Party: USACE
Potential Partners/Coordination: City, Tribe, SNC, DCCED, DHS&EM, NOAA, EPA, Kawerak, Denali Commission, NOAA
Timeframe for Implementation: CRITICAL ACTION
Estimated Cost: $250,000–$500,000
Current Status: New
Reference: N/A

3.4.4 CRITICAL ACTION – Seawall – Phases 3 and 4

Due to ongoing erosion in the community, Shishmaref needs to complete its protective seawall. In 2005, the USACE designed a seawall to protect critical infrastructure. The seawall project was to be implemented in four phases. The first two phases have already been constructed, providing Shishmaref with a seawall that is approximately 2,375 feet long. Phase 3 of the seawall project would add an additional 550 feet of seawall on the ocean side of the community to protect the northern edge of the community, which includes the sewage lagoons and washeteria. Phase 4 of the seawall will protect the southwest portion of the community.

Responsible Party: USACE
Potential Partners/Coordination: City, Tribe, SNC, Kawerak, DCCED, DOT&PF, EPA
Timeframe for Implementation: Critical Action
Estimated Cost: Phase 3 - $7,750,000; Phase 4 - $5–$15 million
Current Status: Ongoing
Reference: *Shishmaref Local Economic Development Plan 2013-2018*

3.4.5 Emergency Plans and Drills

3.4.5.1 Update Emergency Operations Plan

The emergency operations plan (EOP) provides a strategy and outline of action steps that should be taken during an emergency event. The updated emergency operations plan should address preparedness, mitigation, evacuation, response, and recovery. The plan accommodates for the range of needs and issues of diverse community members, including children, Elders, and people with disabilities. The plan will need a regular review and revision cycle, and the community must hold a meeting to educate everyone on the plan. How will the village communicate to other community residents? To other levels of government? Who does the village call? Is it coordinated with other groups? School? Clinic?

As an alternative, the community should consider developing a Small Community Emergency Response Plan (SCERP). A SCERP is intended for small communities (under 2,000) and acts as a quick response reference tool to assist the community's response during a disaster. A SCERP is not intended to replace an EOP; rather it is intended to supplement the EOP and assist during an emergency. Due to the nature of the SCERP, it is typically easier to update and keep current than the EOP.

Responsible Party: City and Tribe
Potential Partners/Coordination: SNC, DHS&EM, FEMA, American Red Cross
Timeframe for Implementation: Ongoing (should be reviewed annually to determine if updates are required)
Estimated Cost: Under $50,000
Current Status: Planned

Evacuation Guidelines

- Know the evacuation routes
- Know where to go
- Leave early enough to avoid being trapped by bad weather
- Listen to VHF/radio for updates
- Wear sturdy clothing
- Bring an emergency kit
- If you don't have an ATV or boat, make arrangements for transportation

Reference: *Shishmaref Emergency Operations Plan*

3.4.5.2 Update Evacuation Plan

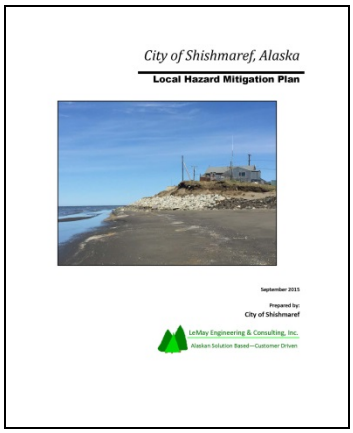
An evacuation plan describes conditions in which an evacuation will be necessary or when to shelter-in-place, what routes and exits are in the area, how to assist family, friends, and coworkers to evaluate, and how to account for everyone after the evacuation process. Specific issues that should be included in the evacuation plan are evacuation routes, location of emergency shelters, who will assist residents with special needs or no transportation, and how to ensure all residents are accounted for.

The community has an evacuation plan, but it has not been implemented thoroughly or practiced by local community members. The school may be a resource in guiding the evacuation plan and drills for the students and their families.

Responsible Party: City and Tribe
Potential Partners/Coordination: SNC, DHS&EM, BSSD
Timeframe for Implementation: Ongoing (should be reviewed annually to determine if updates are needed)
Estimated Cost: Under $50,000
Current Status: New
Reference: N/A

3.4.5.3 Update Local Hazard Mitigation Plan

The *Shishmaref Local Hazard Mitigation Plan* contains information that will assist local government and residents with planning to avoid potential future disaster losses. The plan provides information on natural hazards that affect the village. There is a list of past disasters and projects that may help the community prevent disaster loss. The plan is updated every 5 years. Updating the local hazard mitigation plan regularly adds new information on ongoing projects or whether other disasters need to be added to the list of events. Updated information will also help the community make decisions regarding natural hazards that affect the village. The more knowledge compounded into the hazard mitigation plan, the more knowledgeable policy makers will be to make decisions for their community.



Responsible Party: City, Tribe
Potential Partners/Coordination: SNC, FEMA, DHS&EM, Division of Geological and Geophysical Services (DGGS), NOAA
Timeframe for Implementation: Ongoing (FEMA requires the mitigation plan to be updated every 5 years
Estimated Cost: Less than $50,000
Current Status: Planned
Reference: *Shishmaref Local Hazard Mitigation Plan*

3.4.6 Emergency Energy Backup Plan

An emergency energy backup plan enlists strategies and information on accessing backup energy and fuel during an emergency. This plan lists basic energy sources in the village—water, fuel, generators—and how to access these sources. What are the backup energy options in important community facilities such as the school, village council building, and store? Do families keep extra wood for wood burning stoves? What are backup options for fuel and heating in homes in case of emergencies?

Responsible Party: AVEC
Potential Partners/Coordination: Individuals, businesses, school, Tribe, City, NSHC, AEA, DHS&EM, FEMA
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Under $10,000
Current Status: New
Reference: N/A

3.4.7 Utility Assessments

Utilities include electricity, water, landfill, fuel tank farm, and sewage systems that are consumed or used by the public. The community should work with the service providers to conduct a utility assessment of these systems to determine how well the system would perform in an emergency. Questions to be asked as part of a utility assessment include: Will it survive an emergency? Do people know who to contact if there is an emergency? The utility assessment and inventory will help answer pertinent questions related to emergency strategy and planning. Each utility assessment should include a list of recommended projects and an implementation plan.

Responsible Party: City and Tribe
Potential Partners/Coordination:
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.4.8 Emergency Preparedness Education

It is important that residents are educated about how to prepare for an emergency. Information brochures are quick guides that can provide general information in a fast reading format. The goal of information brochures is to share the information in the most direct and succinct manner. Information brochures would be accessible to community members at no cost and can be placed readily throughout the household, school, or office if necessary. The information brochures should have specific guidelines to follow during an emergency activity and information on how to prepare for unexpected events.

Responsible Party: City and Tribe
Potential Partners/Coordination: DHS&EM, SNC
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.4.9 Early Warning System

An early warning system can issue advance warnings of an incoming storm that alert people to be prepared and save lives. A warning system can be put together in cooperation with the National Weather Service and the local radio/walkie-talkie network. The community should establish an early warning system and apply for funding of a project. Regular tests and alerts should also be conducted in conjunction with regular drills. Make sure people know what the signal is and how to respond. Make sure there is a way to include people with specific challenges such as cognitive, physical, or other disabilities, or lack of transportation. The storm warning system should have a way to alert people who are not within hearing range—people out hunting or doing other activities.

Responsible Party: City and Tribe
Potential Partners/Coordination: SNC, NOAA, DGGS, FEMA, DHS&EM, DCCED, BSSD, National Weather Service
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.4.10 Continue Participation in National Flood Insurance Program

The National Flood Insurance Program tries to reduce the impact of flooding on public and private structures. It does so by encouraging the community to develop and enforce floodplain management regulations and providing affordable insurance to property owners.

Responsible Party: City and Tribe
Potential Partners/Coordination: SNC, NOAA, DGGS, FEMA, DHS&EM, DCCED
Timeframe for Implementation: Ongoing
Estimated Cost: Under $10,000
Current Status: Ongoing
Reference: N/A

3.4.11 Develop Adequate First-Response Capacity

Developing a first-response capacity in the local community is important so that individuals can help prevent fatalities during a catastrophe. Members of the community can get trained for emergency first response by various organizations and online as well. When more people are trained and aware, the faster the community can recover from a disaster or emergency. Trainings can also be done for youth in the school classroom through a variety of student training modules available from the Red Cross. The

community is currently working on building VPSO housing and trying to get a VPSO located in Shishmaref. The VPSO can be a source of guidance and provide trainings to the locals on first response.

Responsible Party: Individuals, City, Tribe
Potential Partners/Coordination: DHS&EM, FEMA, DCCED, American Red Cross, NSHC, VPSO, Department of Public Safety (DPS), Kawerak
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Varies
Current Status: New
Reference: N/A

3.4.12 Establish Volunteer Fire Department

Volunteer firefighters provide emergency services to a community by responding to fires within the community and by being resources to support the local health clinic and other emergency first responders. Shishmaref had as a volunteer fire department, but community residents indicate that it no longer exists.

Having a fire department would lower the risk of fire in the community, as volunteers can learn to be more aware of how to address potential fire and disaster problems on their own. Increasing the use and activity of the fire department is important. Firefighters should receive regular training, visit community centers, and practice fire-handling knowledge on a regular basis.

Responsible Party: City, Tribe
Potential Partners/Coordination: SNC, DPS, DHS&EM, FEMA, DCCED, NHSC, VPSO, Kawerak, EPA, BIA
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Unknown
Current Status: New
Reference: N/A

3.4.13 Search and Rescue Team

Shishmaref residents rely on airplanes, boats, snow machines, and ATVs for traveling around the region. Every year, there are numerous incidents of people who are lost, missing, or fail to return home on time. Volunteer search and rescue teams respond to calls to help locate these individuals. Typically, a local team acts as the first-response team due to their proximity. Frequently, other agencies such as the Alaska State Troopers and the Civil Air Patrol are also engaged in rescue efforts.

In addition to being first responders, search and rescue teams can advocate for and educate other residents on ways to remain safe as they travel around the region.

Responsible Party: City, Tribe

Potential Partners/Coordination: DHS&EM, FEMA, DCCED, American Red Cross, NHSC, VPSO, DPS, Kawerak, Alaska Search and Rescue Association, National Guard, Civil Air Patrol, Alaska Mountain Rescue Group
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Varies depending on ownership of equipment and whether stipends are paid to team members during searches
Current Status: New
Reference: N/A

3.4.14 Work with Local Businesses

Businesses will also need to have personal emergency action plans that address what workers can do to protect themselves and their customers during an unexpected event. What can local businesses contribute during an emergency? Will they have special needs? Do they need a business continuity plan after an emergency occurs? Do they need management courses on preparing for future emergencies?

Responsible Party: City, Tribe, local businesses
Potential Partners/Coordination: Alaska Partnership for Infrastructure Protection, DHS&EM
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Under $10,000
Current Status: New
Reference: N/A

3.4.15 Individual and Household Preparedness

3.4.15.1 Family Evacuation and Disaster Communication Plans

Family evacuation plans are created by families according to their own needs, addressing what to do in the face of an emergency. The community can encourage each family to have an evacuation and disaster communication plan. The family evacuation plan can also outline out what to do when there are family members out of the village and beyond communication reach (e.g., during subsistence hunting). It can identify a safe place to meet, who to contact, a list of important contact information, a list of other important information (e.g., Social Security numbers and bank account numbers), and locations of spare warm clothing, money, and food stashed in the house so the entire family is informed in case of major or long-term emergencies.

Responsible Party: Individuals, DHS&EM
Potential Partners/Coordination: City, Tribe
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Under $10,000
Current Status: New
Reference: N/A

3.4.15.2 Personal Emergency Kits

Personal emergency kits contain a small number of items that may be helpful during an emergency. Everyone in the village should have a kit with enough food, water, and essential supplies to last for at

least 72 hours. The kit can be used at home, in the evacuation shelter, or during an evacuation. The kit should contain warm clothing, a space blanket, socks, a hat, gloves, extra food, Band-Aids or other emergency supplies, medicine, a flashlight, gauze, and more. A grant may provide funding for emergency kits. Further research is needed.

Responsible Party: Individuals
Potential Partners/Coordination: City, Tribe, DHS&EM, FEMA, American Red Cross, private sources
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Varies
Current Status: New
Reference: N/A

3.4.15.3 Smoke and Fire Detectors

Smoke detectors indicate when there is a fire in a building, and an alarm will be activated if the detector senses smoke or fire, alerting people to evacuate the building. The city and council should encourage residents to have working smoke and fire detectors in every home and building in the community, as this increases safety and reduces the likelihood of fires causing significant damage. A grant may need to be pursued from the Red Cross or FEMA to acquire necessary material. An informational meeting on the use and maintenance of smoke detectors may be needed to acquaint residents with the value of fire alarms to homes.

Responsible Party: Individuals, City, Tribe
Potential Partners/Coordination: FEMA, Red Cross, DHS&EM, private sources
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Varies
Current Status: New
Reference: N/A

3.4.15.4 Household Emergency Lighting

Many storms and other hazardous events occur when at night or in the winter when there is not sufficient daylight. Each home should have emergency lighting to allow people to remain safe during a power outage. Emergency lighting can range from a working flashlight or candles with matches to emergency lighting powered by backup generators.

Responsible Party: Individuals, City, Tribe
Potential Partners/Coordination: FEMA, Red Cross, DHS&EM, private source
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Varies
Current Status: New
Reference: N/A

3.4.16 Research and Data Collection

3.4.16.1 Erosion Monitoring

The community should conduct erosion monitoring to help identify erosion rates at different locations near the village and whether the erosion rates are changing. A community-based erosion monitoring program can be developed fairly easily. The community should work with the school to determine if a class would like to conduct erosion monitoring as part of their science studies. Alternatively, the community can find a volunteer or hire someone to conduct erosion monitoring. Ideally, monitoring should be done on a monthly basis and after any storm event.

Responsible Party: Tribe and City
Potential Partners/Coordination: SNC, DGGS, USACE, DCCED, DOT&PF, EPA, BSSD, NOAA
Timeframe for Implementation: Short term (0-5 years)
Estimated Cost: Under $10,000
Current Status: New
Reference: N/A

3.4.16.2 Participate in Local Environmental Observer Program

The Local Environmental Observer Network consists of local experts who share knowledge and experiences to describe unusual environmental change. Experts can apply traditional knowledge, western science, modern mapping, and communication technology to raise awareness about the changing climate. By participating in the observer program, community members can exchange information and also seek help from other communities dealing with similar erosion and problems and find solutions that apply to their community.

Responsible Party: Individuals, City, Tribe
Potential Partners/Coordination: ANTHC, Center for Climate and Health, EPA, Landscape Conservation Cooperatives
Timeframe for Implementation: Short term (0–5 years)

3.4.17 Environmental Education

Environmental education is an integration of academic, scientific, and cultural knowledge that connects youth to hands-on examples and promotes conservation of the natural environment. Environmental education can use local traditional knowledge and scientific knowledge. Integrating environmental education into school programs and community activities complements the holistic view of Inupiat people and makes school more culturally relevant for students. Environmental education can provide a number of benefits to the local community, including the following:

- **Health Benefits** – Youth spend a lot of time playing inside, watching television and playing videogames. By being outside, young people are more physically active, creative, and focused. Hands-on environmental education reduces the likelihood of health problems such as obesity, asthma, and diabetes when children spend more time enjoying the outdoors.
- **Increased Focus** – When more young people spend time outside exploring the environment, they become more focused indoors.

Responsible Party: Tribe and City
Potential Partners/Coordination: SNC, ANTHC, DGGS, USACE, DCCED, DOT&PF, EPA, BSSD, private sources
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: Varies
Current Status: New
Reference: N/A

3.4.18 Additional Heavy Equipment

The community needs heavy equipment during the construction of the storm surge mound, evacuation center, sea wall upgrades, land fill relocation, and a number of other projects. An inventory of heavy equipment needs to be done. If heavy equipment is acquired, a community shop or storage is also needed to protect the equipment from extreme weather tear.

Responsible Party: City, Tribe
Potential Partners/Coordination: SNC, DOT&PF, VSW, Kawerak, Bering Straits Native Corporation
Timeframe for Implementation: Medium term (6–10 years)
Estimated Cost: Various
Current Status: New
Reference: N/A

3.4.19 Emergency Funding

The village needs an emergency funding plan in place in order to make sure that they have an adequate amount of money in case of emergencies and rebuilding purposes. Organizations and agencies need an emergency fund to pay for emergency actions. The community can create a list of agencies and organizations to contact for emergency funding and relief. The city and village council can also set aside money toward an internal emergency fund.

Responsible Party: City and Tribe
Potential Partners/Coordination: NAB, NANA, FEMA, DHS&EM, DOT&PF, ANTHC, BIA, HUD
Timeframe for Implementation: Medium term (6–10 years)
Estimated Cost: To be Determined
Current Status: New
Reference: N/A

3.4.20 Incident Command System Training

The Incident Command System training is a standardized management tool for meeting the demands of small or large emergency and non-emergency situations. The training provides information on planning and command processes for when an emergency occurs. Members of the community can attend Incident Command System training or access the trainings online through the FEMA website.

Responsible Party: City, Tribe
Potential Partners/Coordination: SNC, DHS&EM, FEMA, Red Cross
Timeframe for Implementation: Short term (0–5 years)

Estimated Cost: Under $50,000
Current Status: Planning
Reference: N/A

3.4.21 Outdoor Education Program

Outdoor education programs provide critical thinking skills for how to survive in the outdoors, build self-esteem and self-confidence, and encourage a healthy lifestyle for people of all ages. Survival training programs can take youth out for training. The program can be incorporated with traditional skills in the classroom. Shishmaref already sponsors annual elders and youth summer camp, teaches responsibility, provides awareness of outdoors, and has a whaling camp for youth, but there is also a potential to work with the school on a winter survival class.

Responsible Party: Tribe, BSSD
Potential Partners/Coordination: Camp Fire USA Rural Program, Girl Scouts Rural Summer Program, Alaska Best Beginnings Program, private sources
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Under $100,000
Current Status: New
Reference: N/A

3.4.22 Hire Village Public Safety Officer

The VPSO program is a way to provide public safety services in rural Alaska communities. The program trains and employs people residing in rural villages to serve as first responders to public safety emergencies. The VPSOs have had a significant impact in increasing public safety and quality of life in participating communities.

Responsible Party: Kawerak
Potential Partners/Coordination: City, Tribe, SNC, DPS
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Less than $10,000[3]
Current Status: New
Reference: N/A

[3] A VPSO would work for Kawerak and receive training through the Department of Public Safety. These two entities would incur costs associated with the training and employment of the VPSO. The City and Native Village of Shishmaref are not responsible for these costs.

3.5 Strengthened Traditional Culture

Having a strong traditional culture means residents know where they come from, know who they are, and are proud to be Inupiat. Shishmaref's traditional culture is an important part of who they are; it is an essential part of their identity. Their traditional culture is the basis for their shared values, beliefs, attitudes, and way of life.

Alaska Native communities have always been resilient. For generations, they have been able to adapt to changing conditions such as the introduction of missionaries and outsiders to their community, outmigration of people to urban centers, and changing technology. However, with the introduction of new goods and ideas into the community, it can become easy to forget the traditional ways. For example, many villages have realized that the number of people who can speak their traditional language is dwindling.

A community with a strong culture is more resilient because the people are able to maintain their identities and critical knowledge and practices while incorporating new technologies, products, and ideas into their lives. For example, many communities now use snow machines to help them with hunting because it allows them to travel farther and increase their productivity. A resilient community can preserve and embrace its heritage while evolving to meet current needs.

The main strategies to increase Shishmaref's resiliency through its traditional culture are:

- Connected and engaged community
- Inclusive and welcome community
- Arts, cultural, and recreation opportunities
- Cultural preservation

3.5.1 CRITICAL ACTION – Increase Use of Traditional Knowledge

Alaska Natives have a unique understanding of the connections between people and their environment learned through generations of living with the land and learning how to adapt to environmental changes to survive. These understanding are general known as traditional knowledge.

Traditional knowledge is defined by the International Council for Science (2002) as:

> *A cumulative body of knowledge know-how, practices and representations maintained and developed by peoples with extended histories of interaction with the natural environment. These sophisticated sets of understandings, interpretations and means are part and parcel of a cultural complex that encompasses language, naming and classification systems, resource use practices, ritual, spirituality and worldview.*

Alaska Native communities have expressed concerns about government agencies not incorporating traditional knowledge into the decision-making process. Some believe this leads to traditional knowledge being discounted, compared to "western science" information. In recent years, more agencies have acknowledged the importance of traditional knowledge and are working on how to integrate the information. It is not a case where one type of knowledge is superior to the other. By

combining both, we are able to develop a better understanding of climate change and community impacts. We are also able to design resiliency solutions that are scientifically sound and also connect to the local values, needs, and priorities.

Responsible Party: Various

Potential Partners/Coordination: City, Tribe, NSHC, BSSD, BIA, DCCED, DOT&PF, USFWS, ADF&G, NOAA, EPA, ANTHC, VSW, University of Alaska, Kawerak
Timeframe for Implementation: Critical Action
Estimated Cost: Unknown
Current Status: New
Reference: N/A

Using Traditional Knowledge can:

- Provide historical information
- Better identify potential environmental impacts
- Help build relationships between organizations
- Lead to better decision making
- Increase capacity within a community
- Build an awareness of and appreciation for traditional knowledge

3.5.2 Continue Community Events

Community events are important because they bring residents together to engage with their community and each other. There are several existing community events in Shishmaref, such as the end of school year lunch, village health fair, a fall carnival, first catch community feast, youth/elders camp, and Family Fun Night.

Continuing to have community events will help everyone interact positively with each other, and will promote healthy principles and happier residents. Communities with high participation in community activities tend to have more community cohesion and fewer negative social issues such as alcohol and drug problems.

Responsible Party: Various
Potential Partners/Coordination: City, Tribe, NSHC, BSSD
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Existing funding
Current Status: Ongoing
Reference: N/A

3.5.3 New Community Events that Celebrate Traditional Culture

Community events bring people together for positive reasons. Local events celebrating traditional culture exist, but new events can bring family, elders, and children together to celebrate subsistence and other traditions. New events can also provide opportunities for residents to gain leadership skills by volunteering to help organize and run an event.

Responsible Party: To be determined
Potential Partners/Coordination: Council, Tribe, First Alaska Institute
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Varies

Current Status: New
Reference: N/A

3.5.4 Community Story Project

A community story project is an opportunity for youth to ask elders about Shishmaref's history and then encapsulate their stories in web, radio, or written media. Community story projects are important as they help young people connect with elders and instill a sense of pride over the region's cultural heritage. A community story project is also a way to share community values.

Responsible Party: To be determined
Potential Partners/Coordination: City, Tribe, SNC, BSSD
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Under $50,000
Current Status: New
Reference: N/A

3.5.5 Elders in School Program

Elders are teachers, mentors, and role models in the community. They have a vital role in promoting the integration of traditional language and culture into the school curriculum. They have important skills and knowledge they can share with Shishmaref's children and youth. It is also a way for elders to continue giving back to the community and a way for them to share their wisdom and experiences.

The community should work with the school district to have Elders from the community involved in the classroom. Elders can have the chance to speak with children about local history, geography, wildlife, plants, sustainable resources management, and other topics. Elders in the classroom sharing stories and knowledge will also help young people learn more and respect their cultural heritage. This program would also provide some students with an elder in their life (for those who may not otherwise have one). In addition, elders can also help strengthen the relationship between teachers, students, parents, and the general community.

Responsible Party: Tribe, BSSD
Potential Partners/Coordination: Kawerak, City, SNC
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Under $50,000
Current Status: New
Reference: N/A

3.5.6 Increase Use of Traditional Language

Language is an integral part of traditional knowledge systems. The community has expressed a concern that residents are losing their traditional language. They have indicated that they would like to increase the use of Inupiaq in the community. The community should work together to identify the most appropriate ways to increase usage of Inupiaq. Potential ways include offering Inupiaq lessons at the school for both youth and adults, providing written resources and public notices that can be written in both English and Inupiaq, maintaining a list of volunteer translators, and conducting community meeting

in English and Inupiaq. The oral tradition of Inupiaq language, drum and craft making, and storytelling are integral to increasing traditional cultural knowledge.

The community has expressed a desire for immersion programs in the classroom and that the community should pursue having bilingual teachers in the classroom so students are learning how to be conversant in Inupiaq, not just knowing words. The community has also indicated they would like programs for adult learners, not just youth.

Responsible Party: Tribe
Potential Partners/Coordination: BSSD, SNC, City
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.5.7 Develop Elders Program

Shishmaref should develop an Elder Program to support elders residing in the community who need some additional assistance with certain activities. An Elder Program can help provide food, medicine, clothing, transportation, and other assistance. The program can be on a voluntary basis, but students and the community may be able to organize a small stipend or receive credit for helping. A Native Elder Program is beneficial for locals, as it helps connect different age groups and helps the community come together for something positive.

Responsible Party: City and Tribe
Potential Partners/Coordination: SNC
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.6 Leadership for the Future

Confident leadership can lead to a more cohesive and resilient community. Understanding how leadership operates is essential for residents to be able to support leadership decisions and is an important part of holding leadership accountable to their constituencies.

Leadership also means ensuring the community has the financial resiliency to allow it to withstand potential economic downtowns. Leadership needs to protect the community by ensuring the financial position of the community is strong through responsible and transparent fiscal practices.

Key leadership strategies to support Shishmaref's resiliency are:

- Open, accountable, and responsive government
- Collaborative, engaged leadership
- Proactive financial management
- Organizational practices
- Opportunities for positive community building
- Support for all residents

3.6.1 CRITICAL ACTION – Leadership Development

Leaders must have the foresight to see potential challenges, plan for the future, and be involved in the decision-making processes on behalf of the community. Shishmaref has expressed the need for more leadership development opportunities to ensure community leaders have the necessary skills to lead Shishmaref into the future. Through leadership development and capacity-building opportunities, the community can continue to maintain strong local leadership and governance. When community leaders gain more knowledge and become more self-aware of their skills, this can help them effectively communicate with agencies, other government officials, and the community at large. Strong leadership will also be necessary as the community attempts to become a more resilient community.

Leadership training encourages several important skills, including:

- Be accountable to the community;
- Improve and enhance personal skills;
- Promote volunteerism; and
- Create positive community impacts.

Leadership Development Programs

Leadership development programs can take many different forms, ranging from 1-hour webinars to degree programs. Listed below are several leadership development programs that are likely to be of interest for Shishmaref.

- **University of Alaska Fairbanks Alaska Native Studies and Rural Development Program** – The program aims to increase cultural awareness and strengthen leadership capacity for rural and Indigenous communities in Alaska and the Circumpolar North. The program offers opportunities for Bachelor's and Master's degrees by distance audio conferencing. There is also a variety of

Alaska Native Studies and Rural Development courses available for students. For more information: https://www.uaf.edu/dansrd/overview/history/

- **Native Nation's Native Alaska Leadership Forum** – This 2-day leadership forum is a live interactive training in Juneau, Alaska, where participants will practice and gain specific skills to support them in personal leadership development. Participants learn about developing a leadership mission, learn communication skills, explore time-management strategies, and build a template for mentoring leaders to bring back to each person's respective community. For more information: http://www.nativenationevents.org/second-annual-native-alaskan-leadership-forum/
- **First Nations Development Institute's Leadership, Entrepreneurial, and Apprenticeship Development Institute Conference** – First Nations provides capacity training and has supported projects to help revitalize Native communities, while integrating social empowerment and economic strategies. The conference trains emerging and existing Native and tribal leaders grow professionally, share ideas, and learn new skills related to asset-building. Training tracks include strengthening tribal and community institutions, nourishing Native foods and health, and empowering youth through asset building. Each year's conference is typically held in September or October. For more information: http://www.firstnations.org/programs/strengthening-institutions
- **National Congress of American Indians** – The National Congress of American Indians (NCAI) represents a diverse network of tribal nations, citizens, and Native organizations. The NCAI aims to protect and enhance Native sovereign rights, promote common understanding of tribes in the family of American governments, and improve the quality of life for Native communities. The NCAI hosts a number of leadership trainings, conferences, and programs available for members and non-members. The trainings and conferences occur throughout the country on specific issues ranging from emerging leaders' training to child welfare and youth-specific programs. For more information: http://www.ncai.org/conferences-events
- **Alaska Native Fund** – The fund, which was created by the Alaska Conservation Foundation and the Alaska Native Steering Committee, provides an indigenous framework for impacting environmental issues while promoting innovative strategies to strengthen capacity of Alaska Native organizations and committees. The fund reimburses expenses up to $10,000. Policy development, leadership, youth organizing, and gatherings are priority issues for the Alaska Native Fund. For more information: https://alaskaconservation.org/grant-opportunities/alaska-native-fund/
- **Alaska Pacific University Alaska Native Executive Leadership Program Certificate** – The Alaska Native Executive Leadership Program Certificate is a partnership program with courses that represent an executive leadership development curriculum co-designed to enhance and develop future Alaska Native leaders. For more information: http://catalog.alaskapacific.edu/preview_program.php?catoid=6&poid=224&returnto=121
- **Alaska Native Tribal Health Consortium Tribal Capacity and Training** – ANTHC's Tribal Capacity and Training program provides technical assistance and training to Tribal governments to build capacity and enhance local environmental program management. The program hosts a number

of scheduled multi-day trainings and workshops in Anchorage, as well as webinars throughout the year. For more information: http://anthc.org/what-we-do/community-environment-and-health/tribal-capacity-and-training/

- **United Indian Health Services Gathering of Native Americans** – The gathering is a 4-day journey focused on increasing the strengths of Native youth and community. The program provides a curriculum for Native Americans and others who want to be community leaders and capacity builders. For more information: http://cops.usdoj.gov/Default.asp?Item=2621
- **Rural Community Assistance Corporation's Leadership Development Program** – RCAC developed a curriculum with Western New Mexico University to include the building blocks for volunteer leadership in community development efforts. The leadership program costs about $2,300 per person, and includes logistical expenses for space, meals, and travel expenses. For more information: http://www.rcac.org/community-economic-development/leadership-development/
- **NeighborWorks® America Community Leadership Institute** – NeighborWorks®' Native CDFIs' program provides training and technical assistance to Native America or Alaska Native groups. In-person trainings are available at the NeighborWorks® Training Institute in Washington, DC. Webinars are also available online. NeighborWorks® America provides a broad range of additional leadership resources, with an eClassroom option, virtual classes, and eLearning options. For more information: http://www.neighborworks.org/Training-Services/Training-Professional-Development/Specialized-Training/Community-Leadership-Institute

Responsible Party: City, Tribe, SNC, Individuals
Potential Partners/Coordination: DCCED, Kawerak, BIA, ANTHC, Department of Labor and Workforce Development, Department of Education & Early Development, Denali Commission, BSSD, Alaska Federation of Natives, Alaska Pacific University, University of Alaska Fairbanks, NeighborWorks, NCAI, Alaska Conservation Foundation, Native Nations, First Nations Development Institute, EPA, private sources
Timeframe for Implementation: Critical Action
Estimated Cost: Various
Current Status: New
Reference: N/A

3.6.2 CRITICAL ACTION – Improve Government-to-Government Relations

Improving government-to-government relations will help elicit trust among different government levels—tribal council, city, regional, and state level—as well as various state agencies. Continued interaction and correspondence will help make sure everyone is on the same page with the same ideas, and no relationships are destroyed through the process.

Responsible Party: Tribe and City
Potential Partners/Coordination: SNC, BIA, DOT&PF, DCCED, ADEC, USFWS, EPA, NOAA, ADF&G, FAA, Kawerak, BSSD, NSHC, ANTHC, VSW, DHS&EM, FEMA, HUD, DPS, Denali Commission
Timeframe for Implementation: Critical Action
Estimated Cost: Under $50,000

Current Status: Ongoing
Reference: N/A

3.6.3 Continue Strong Local Leadership and Governance

The City of Shishmaref, Tribe, and SNC have a long history of working together to lead the community. Their working relationship has had a positive impact on the community and results in projects and programs being implemented.

By continuing the strong local leadership and governance, the community will continue to thrive. The community can encourage good leadership by recognizing their leaders and encouraging mentorship programs so that everyone has the opportunity to make a difference in Shishmaref. Communities can continue to support their local leaders by being active in their public affairs and involved in community projects.

Responsible Party: City, Tribe, and SNC
Potential Partners/Coordination: N/A
Timeframe for Implementation: Ongoing
Estimated Cost: Under $50,000
Current Status: Ongoing
Reference: N/A

3.6.4 Continue to Support Youth Leadership Programs

Youth involvement is essential to growing successful future leaders in the community. The community needs to continue to support youth leadership programs, as they help grow future community leaders. Leadership programs can include job shadowing, youth representatives on City boards, and other community involvement activities. These opportunities will teach youth the values of hard work, responsibility, reward, and stewardship to their community.

Responsible Party: Individuals, Tribe, City
Potential Partners/Coordination: BSSD
Timeframe for Implementation: Ongoing
Estimated Cost: Under $50,000
Current Status: Ongoing
Reference: N/A

3.6.5 Continue Having City and Tribal Council Meetings Open to the Public

Shishmaref should continue having City and Tribal Council meetings open to the public and encourage community residents to participate in the meetings. Listening to the public and being responsive to their needs are important parts of responsible governance and promote transparency.

Ways to increase participation include:

- Having a community-wide annual meeting/celebration that can bring everyone together and also provide more transparency between these governing groups and the public.

- Producing meeting minutes that can be easily accessible to everyone via email, website, or social media outlets.
- Providing translators, transportation, and other assistance so that people who traditionally have difficulties participating in meetings have a way to contribute to important community discussions, despite barriers.
- Having a meeting schedule established for the entire year so people know when meetings will take place.

Responsible Party: Tribe and City
Potential Partners/Coordination: SNC
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Under $50,000
Current Status: Ongoing
Reference: N/A

3.6.6 Organizational Mapping

An organizational network mapping is a comprehensive tool with which leaders can connect with each other in the community and in the region so there is more communication and information exchange between the communities. Mapping key leaders, groups, and organizations helps the community mainstream who to contact appropriately, depending on the crisis.

Responsible Party: Tribe and City
Potential Partners/Coordination: SNC, Kawerak, DCCED, DHS&EM, BSSD, DHS&EM, FAA, FEMA, USFWS, ADF&G, NOAA, EPA, Alaska Department of Natural Resources (DNR), AVEC, VSW, ANTHC, NSHC, Bering Straits Native Corporation, Bering Straits Regional Housing Authority, Norton Sound Economic Development Corporation
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Under $50,000
Current Status: Ongoing
Reference: N/A

3.6.7 Continue Joint City and Native Village of Shishmaref IRA Council Meetings

Shishmaref currently has several joint City and IRA Council meetings every year. This should continue because it increases interaction between the two governing groups, helps eliminate possible communication barriers, and helps ensure that the City and IRA Council coordinate on how to address various community issues. Coordination is critical because the City and IRA Council both have access to different funding sources. By working together, the community can be more strategic and creative about how to implement needed projects.

Responsible Party: Tribe and City
Potential Partners/Coordination: SNC
Timeframe for Implementation: Ongoing
Estimated Cost: Under $50,000

Current Status: Ongoing
Reference: N/A

3.6.8 Develop Communication Plan

The communication plan lays out the necessary information for the City and Tribe on how they will communicate the latest plans and ordinances or updates of the relocation process to the community. The communication plan can incorporate flyers at key public facilities and use social media to disperse information to the rest of the community.

Responsible Party: Tribe and City
Potential Partners/Coordination: SNC, DCCED
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Under $50,000
Current Status: Ongoing
Reference: N/A

3.6.9 Review/Establish Procurement Policy

A procurement policy lists the process and regulations that guide the acquisition of goods and services needed by the City and Tribe. The policy aims to communicate the process of purchasing goods and services to everyone within the organizations.

Responsible Party: Tribe and City
Potential Partners/Coordination: SNC
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Under $50,000
Current Status: Ongoing
Reference: N/A

3.6.10 Develop Strategy to Include Local Business in Decision-Making Process

Develop a strategy to include input from local businesses in decisions made by community leadership.
Responsible Party: Tribe and City
Potential Partners/Coordination: SNC, DCCED
Timeframe for Implementation:
Estimated Cost: Under $50,000
Current Status: Ongoing
Reference: N/A

3.6.11 Continue Elders Advisory Committee

Shishmaref should retain its Elders Advisory Committee. The Elders Advisory Committee can provide counsel to the City and Tribe on community issues. Elders can share their traditional wisdom with community leadership and provide input on elder needs.

Responsible Party: Tribe, City
Potential Partners/Coordination: Kawerak, SNC

Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: Under $50,000
Current Status: Ongoing
Reference: N/A

3.7 Relocation

Shishmaref is expected to face extreme storm events in the upcoming years as changes in the climate occur and the shore ice provides a decreasing amount of protection from various storms. The community has elected to relocate in the past, and several studies have been conducted in support of these efforts. However, the relocation process has not advanced past the planning stage. One issue that Shishmaref has faced is a lack of consensus between the community and government agencies on where the community should relocate. Shishmaref is currently deciding if they will continue to pursue relocation (see Action Item 3.7.1) or remain at the existing village site. If they choose to remain in place, the rest of the relocation action items should not be pursued and the SMP should be updated to reflect their decision to remain in place.

3.7.1 IMMINENT ACTION – Decision Regarding Relocation

Shishmaref has reached a point where it must decide between two options for the long-term survival of Shishmaref:

- Relocate the community
- Harden Sarichef Island's coastline to prevent future erosion, protect existing infrastructure, and develop new land for the expansion of the community.

Completed in February 2016, the *Relocation Site Selection Feasibility Study* presented three potential relocation sites as well as a protect-in-place alternative. The results of this study are being shared with the community so they can make an informed decision in the July 2016 vote to decide if Shishmaref will relocate to one of the three sites or remain in place.

Educating residents is an essential part of this process, as is addressing community concerns about the relocation. Concerns that have been expressed so far include how the community would continue to access the coast and what would happen to the cemetery.

Responsible Party: City
Potential Partners/Coordination: DCCED, DOT&PF, SNC, FAA, USFWS, DNR, ADF&G, DGGS, DHS&EM, USACE, EPA, BIA, NOAA, Denali Commission, HUD, BSSD, Kawerak, VSW, USCG, AEA, ADEC, AVEC, NSHC, ANTHC, CCHRC, DNR
Timeframe for Implementation: Critical Action
Estimated Cost: Under $10,000
Current Status: New
Reference: N/A

3.7.2 Acquire Title

A title is a document that refers to having the rights to own a specific property. The title gives the owner exclusive rights. The City and Tribe would need to acquire title to the land on which the selected site is located in order to gain the exclusive rights to live there and use the land.

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, DOT&PF, Kawerak, BIA, SNC, DNR, landowners

Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.3 Survey Site

A site survey is when an area of proposed work or project is surveyed and inspected. The information from this survey determines which areas are most suitable for access and building while also laying out the constraints of the site. The surveying process helps determine which areas within the site are suited for the best design.

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, DOT&PF, VSW, Kawerak, DGGS, DNR, landowners
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.4 Identify Quarry Site

A quarry site is an open excavation or pit from which rock is obtained. The process typically uses cutting and blasting of an area. A quarry source is important, as it provides rocks and other heavy material used for building rip rap, barriers, smaller gravels, and road construction projects. The community needs to identify a quarry site that is relatively close to the village site.

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, DOT&PF, DNR, DGGS, SNC
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.5 Identify and Prioritize Community Needs

What are the community's goals and needs when it comes to relocating? It's important to have dialogue and include all community members, and to have regular meetings to ensure that community needs are identified throughout the site selection process and there is an opportunity to express sentiments when new ideas are exchanged.

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, DOT&PF, SNC, FAA, USFWS, DNR, ADF&G, DGGS, DHS&EM, USACE, EPA, BIA, NOAA, Denali Commission, HUD, BSSD, Kawerak, VSW, USCG, AEA, ADEC, AVEC, TeleAlaska, NSHC, ANTHC, CCHRC
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New

Reference: N/A

3.7.6 Develop Community Layout Plan

A community layout plan determines where important buildings, homes, the clinic, and the school will be laid out in the proposed relocated site. The planning process will determine specific project aspects, such as how the village's school, community center, and clinic will be located in relation to housing, water facilities, and the landfill or airport runway. The community must conduct a series of meetings and discuss the layout they hope to achieve.

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, DOT&PF, SNC, FAA, USFWS, DNR, ADF&G, DGGS, DHS&EM, USACE, EPA, BIA, NOAA, Denali Commission, HUD, BSSD, Kawerak, VSW, USCG, AEA, ADEC, AVEC, TeleAlaska, NSHC, ANTHC, CCHRC
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.7 Infrastructure Feasibility Studies

An infrastructure feasibility study attempts to objectively assess a site and determine whether it can accept infrastructure projects by understanding the project site's strength and weaknesses. Infrastructure feasibility studies help determine what areas are better, easier to work on, and the most cost-effective for the project. The community can discuss and seek additional help for this from other agencies.

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, DOT&PF, SNC, FAA, USFWS, DNR, ADF&G, DGGS, DHS&EM, USACE, EPA, BIA, NOAA, Denali Commission, HUD, BSSD, Kawerak, VSW, USCG, AEA, ADEC, AVEC, TeleAlaska, NSHC, ANTHC, CCHRC
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.8 Environmental Studies

Environmental studies are an important part of the process of developing the new village site. They identify and document environmental issues that need to be considered as part of the development process. Typical environmental studies include wetland delineations, geotechnical investigations, cultural resource studies, hydrology studies, and fish and wildlife studies. These studies can be done independently or in conjunction with the development of community facilities.

Environmental studies are frequently performed as part of the National Environmental Policy Act process or as part of the permitting process.

Prior to any environment studies, agency coordination should occur to identify the specific studies that should be conducted, the methodology to be used for the studies, and the potential to share studies among different agencies that require environmental information.

Responsible Party: Various
Potential Partners/Coordination: DCCED, DOT&PF, FAA, VSW, AEA, NOAA, USFWS, ADF&G, USACE, BLM, USCG, State Historic Preservation Officer, ADEC, ADNR, National Marine Fisheries Service, EPA, Kawerak
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.9 Identify Water Source

A safe, uncontaminated water source is necessary for the existence of any community. Determining whether there is a viable water source at the new site is important because water is also necessary for many household and community purposes. When identifying water sources, the community needs to consider several questions: Is the ground stable? Are there possibilities of contamination or runoff and erosion near the water source? What are some steps to prevent these problems?

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, DOT&PF, VSW
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.10 Identify Resources That Can Be Reused

Identifying which resources can be reused will help the community determine the importance of these resources. What are subsistence opportunities at the site? Are there reindeer that can be herded and the community can use to subsist on? Are there ample whitefish, blackfish, or burbot species to fish for? Is there an area where firewood may be accessible?

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, DOT&PF, SNC, FAA, USF&WS, DNR, ADF&G, DGGS, DHS&EM, USACE, EPA, BIA, NOAA, Denali Commission, HUD, BSSD, Kawerak, VSW, USCG, AEA, ADEC, AVEC, NSHC, ANTHC, CCHRC
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.11 Detailed Construction and Financing Plan

A detailed construction and financing plan is important to organize. Laying out a plan will help keep costs lower on the construction projects while also meeting specific deadlines for construction. How will the community consider paying for the relocation process? Impact fees? Loans? The financing plan will help determine the best ways to accommodate the community's needs.

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, DOT&PF, SNC, FAA, USFWS, DNR, ADF&G, DGGS, DHS&EM, USACE, EPA, BIA, NOAA, Denali Commission, HUD, BSSD, Kawerak, VSW, USCG, AEA, ADEC, AVEC, TeleAlaska, NSHC, ANTHC, CCHRC
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.12 Leadership Agreement

Local leading organizations in the existing village need to come together to write a leadership agreement document for the new community that outlines the specific responsibilities that hold leading organizations accountable for their actions. The City, Tribe, and Corporation must come together with the rest of the community to write an agreement to which local leaders will adhere.

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, SNC
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.13 Relocation Committee

The relocation committee will be put in charge of organizing meetings, working with contractors, and acting as liaison to the rest of the community on the relocation process. The relocation committee can be comprised of people from the City, Tribe, and Corporation, state agencies, and regional corporations that can provide input and assistance as well as leadership during the relocation process.

Responsible Party: City, Tribe, and SNC
Potential Partners/Coordination: DCCED, DOT&PF, FAA, USFWS, DNR, ADF&G, DGGS, DHS&EM, USACE, EPA, BIA, NOAA, Denali Commission, HUD, BSSD, Kawerak, VSW, USCG, AEA, ADEC, AVEC, TeleAlaska, NSHC, ANTHC, CCHRC
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.14 Community Education

As part of the relocation effort, community residents will have to be educated about their new village and potential changes to their lifestyle. For example, residents will have to be made aware of the ownership of nearby property and any restrictions regarding hunting, berry picking, or other activities on that land.

Responsible Party: City, Tribe
Potential Partners/Coordination: SNC, Kawerak
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.15 Develop Access to New Site

Access to the new site needs to be developed in order for relocation and the construction process to occur. Where can a road be built? What is the best site for a runway? Is there access to the site location by barge or boat? Is there a lake nearby that can be used for plane landings in the winter and summer?

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, DOT&PF, SNC, FAA, USFWS, DNR, ADF&G, DGGS, DHS&EM, USACE, EPA, BIA, NOAA, Denali Commission, HUD, BSSD, Kawerak, VSW, USCG, AEA, ADEC, AVEC, ANTHC
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.16 Develop Long Range Transportation Plan

The long range transportation plan identifies the community's transportation needs and goals. This planning process should also meet the current and future land use, economic, and environmental goals. The transportation plan considers a full range of transportation modes, which may include 4x4 or snow machine, bicycle, and pedestrian travel. The planning process also determines funding opportunities and recommendations for implementing the plan.

Responsible Party: Kawerak
Potential Partners/Coordination: City, Tribe, DCCED, DOT&PF, SNC
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.17 Build Initial Housing

The community needs to determine what kind of housing will be built at the relocation site. Who will go into the first homes built? What do families want to have considered in the housing construction process? Who will help pay for the cost of these homes?

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, HUD, EPA, VSW, AVEC, DOT&PF, DHS&EM, Kawerak
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.18 Develop Initial Infrastructure

The community needs to lay out the initial infrastructure that will be used as the foundation that guides the growth of the community. Initial infrastructure could include sewage, water, and other utility lines, roads, an airport, a wastewater location, public housing, a school, and a city building site.

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, DOT&PF, SNC, FAA, USFWS, DNR, ADF&G, DGGS, DHS&EM, USACE, EPA, BIA, NOAA, Denali Commission, HUD, BSSD, Kawerak, VSW, USCG, AEA, ADEC, AVEC, TeleAlaska, NSHC, ANTHC, CCHRC
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.19 Develop Well at New Site

A water well is an excavation or structure created in the ground by digging, driving, or drilling to access ground water located in underground aquifers. The well water is drawn by pump or raised mechanically or brought up by hand in some regions. Developing a well in the new site is important because it provides a local water source for the community.

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, DOT&PF
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.20 Develop Remaining Infrastructure

Finish building the remaining infrastructure needed for the relocation site. Examples may include critical emergency infrastructure that may mitigate potential for severe storms and floods, emergency services available, and other public works buildings, and a storm shelter or a multi-purpose building to store construction equipment and other hard equipment used in the relocation process.

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, DOT&PF, SNC, FAA, USFWS, DNR, ADF&G, DGGS, DHS&EM, USACE, EPA, BIA, NOAA, Denali Commission, HUD, BSSD, Kawerak, VSW, USCG, AEA, ADEC, AVEC, TeleAlaska, NSHC, ANTHC, CCHRC
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.21 Develop Remaining Housing

Finish building the remaining housing needed for the village site. This may include low-income housing, elder housing, multi-family housing, and single family homes. Determining what is needed in the new village and what can be left behind in the old site location is necessary in the development of housing.

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, HUD, EPA, VSW, AVEC, DOT&PF, DHS&EM, Kawerak
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.7.22 Restore Old Village Site

Restore the old village site so that garbage, waste, and wastewater is covered, evacuated, or put down properly. The townsite should be restored to its natural condition and look like the surrounding landscape.

Responsible Party: City and Tribe
Potential Partners/Coordination: DCCED, DOT&PF, SNC, FAA, USFWS, DNR, ADF&G, DGGS, DHS&EM, USACE, EPA, BIA, NOAA, Denali Commission, HUD, BSSD, Kawerak, VSW, USCG, AEA, ADEC, AVEC, TeleAlaska, NSHC, ANTHC, CCHRC
Timeframe for Implementation: Long term (11+ years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.8 Other

This section documents action items that are not included in one of the other strategic focus areas.

3.8.1 Community Food Assessment

A community food assessment surveys the existing food products and sources to see if the community has a sufficient food supply during an emergency. The community needs to assess what the food sources are, whether people have emergency food, whether there is the ability to subsist locally and what the local game can bring, and whether food can be set aside for future catastrophic emergencies.

Responsible Party: City and Tribe
Potential Partners/Coordination: SNC, BSSD, EPA, Individuals
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.8.2 Establish Communication with Potential Future Residents

In recent years, there has been a migration from rural Alaska to larger urban centers. Some people would prefer to remain in Shishmaref but have to leave for work, education, or other purposes. The community should develop ways to keep in touch with people who may want to return to Shishmaref. By communicating with people about what is going on in the community, education, and work opportunities, people who have moved away may find it easier to return.

Responsible Party: City and Tribe
Potential Partners/Coordination: SNC
Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

3.8.3 Increase Awareness about Existing Substance Abuse Programs

The community wants to encourage residents to choose healthy lifestyles. A topic of particular concern to community residences is substance abuse. Substance abuse programs help local residents get assistance from programs that have the capacity to help. The community should work with local partners such as the school district and the NSHC to increase awareness about existing substance abuse programs.

Responsible Party: City and Tribe
Potential Partners/Coordination: DHSS, Substance Abuse and Mental Health Services Administration, NSHC, SNC, ANTHC

Timeframe for Implementation: Short term (0–5 years)
Estimated Cost: To be determined
Current Status: New
Reference: N/A

4 Next Steps

The next step is for the community to lead the implementation of the SMP. The community has indicated that the community coordinator position is vital to their ability to make the community more resilient. The community coordinator would have the responsibility to implement the SMP as well as coordinate other resiliency-related projects. Creating a dedicated position such as this one would be more effective than adding those duties to an existing position.

Other specific steps for implementation include:

- **Accountability** – Having a plan is not the same as implementing the plan. To be successful, Shishmaref needs to identify specific people to be responsible for each action item. These individuals should report back to the community on a regular basis.
- **Monitoring** – Shishmaref should decide how they want to monitor and update the SMP. The SMP is a living document to help the community become more resilient. The community should work with their partners to assess the plan and update it at least annually. Keep the plan fluid—adapt to changes. Don't be afraid to change the plan if needed.
- **Support** – Gain support to implement action items from existing and new partners, including continuing to hold Interagency Working Group meetings. Identifying funding so that community leadership can participate in Interagency Working Group meetings is important because it will allow the community to deepen the relationship it has with the agencies.
- **Communicate** – Keep people informed of progress. Shishmaref should share with residents and agency partners the progress they have made in implementing the plan.
- **Celebrate** – As action items are completed, or at substantial milestones, celebrate these accomplishments. Celebrations can help keep everyone excited and engaged.

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Appendix A
Shishmaref Interagency Working Group Invitees

Shishmaref Interagency Working Group Invitees

The following individuals and organizations were invited to participate in the Shishmaref Interagency Working Group.

Agency	Name
AECOM	Scott Simmons
Alaska Department of Commerce, Community, and Economic Development, Division of Community and Regional Affairs	Katherine Eldemar
	Debbie Leamer
	George Plumley
	Sally Russell Cox
	Diane Sam
	Leroy Seppilu
	Jimmy Smith
Alaska Department of Environmental Conservation	Trisha Bower
Alaska Department of Military and Veterans Affairs, Division of Homeland Security and Emergency Management	Ann Gravier
	Scott Nelson
	Brent Nichols
Alaska Department of Natural Resources	Alexander Gould
Alaska Department of Natural Resources Division of Geologic and Geophysical Surveys	Deanne Stevens
Alaska Department of Transportation and Public Facilities	Ryan Anderson
	Ruth Carter
	Mike Coffey
	Alexa Green
	Jeff Roach
	Harvey Smith
	Lauren Staft
Alaska Energy Authority	Tim Sandstrom
Alaska Housing Finance Corporation	Mark Romick
Alaska Industrial Development and Export Authority	Jedidiah Drolet
	David Lockard
	Sandra Moller
	Timothy Sandstrom
Alaska Institute for Justice	Robin Bronen
	Denise Pollock
Alaska Native Tribal Health Consortium	Dan Bocchia
	Michael Black
	Mia Heavener
	Raymond O'Neil
	John Warren
Bering Straights Native Corporation	Jerald Brown
Cold Climate Housing Research Center	Aaron Cooke
	Jack Hebert
City of Shishmaref	William Jones
	Melanie Weyiouanna
CRW Engineers	Jeff Stanley
Denali Commission	Chris Allard
	Jay Farmwald
	Joel Neimeyer
International Arctic Research Center, UAF	David Atkinson
Kawerek Corporation	Sean McKnight
	Denise Michaels

Agency	Name
	Anahma Shannon
	Jane Stevenson
McClintock Land Associates	Bill McClintock
	Sharon McClintock
MJ King and Associates	Margaret King
Native American Rights Fund	Erin Dougherty Lynch
Native Village of Shishmaref	Tony Weyiouanna
Native Village of Shishmaref Community Coordinator	Fred Eningowuk
Office of Senator Lisa Murkowski	Deborah Vo
Oregon State University	Elizabeth Marino
Shishmaref Native Corporation	Molly Shell
	Darlene Turner
Shishmaref Native Corporation (Attorney to)	Glen Price
St. Laurence University	Jon Rosales
Tetra Tech	Christy Miller
U.S. National Oceanic and Atmospheric Administration	Amy Holman
U.S. Coast Guard	James Helfinstine
U.S. Army Corps of Engineers	David Williams
	Allen Churchill
	Bruce Sexauer
U.S. Department of Agriculture/Natural Resources Conservation Service	Kristine Tapio-Harper
	Phil Naegele
	Robert Jones
	Scott Crockett
U.S. Department of Housing and Urban Development	Deb Alston
	Colleen Bickford
	Toni Morse
	Carma Reed
	Bill Zachares
U.S. Environmental Protection Agency	Tami Fordham
U.S. National Oceanic and Atmospheric Administration	Amy Holman
U.S. National Park Service	Jim Atkinson
	Jeanette Koelsch
WH Pacific	Jackie Schaeffer