FAIRBANKS NORTH STAR BOROUGH

Action Plan Chapter

Developed by RESPEC for the FNSB Assembly Climate Action Committee

December 2022

Key Terms

Action: The result of carrying out a strategy.

Adaptation: Strategies that will help make FNSB policies, operations, and infrastructure more resilient to changing climate conditions and impacts such as extreme weather events, thawing permafrost, increased flooding, increased drought and forest fires, declines in biodiversity, and more variable temperatures throughout the year.

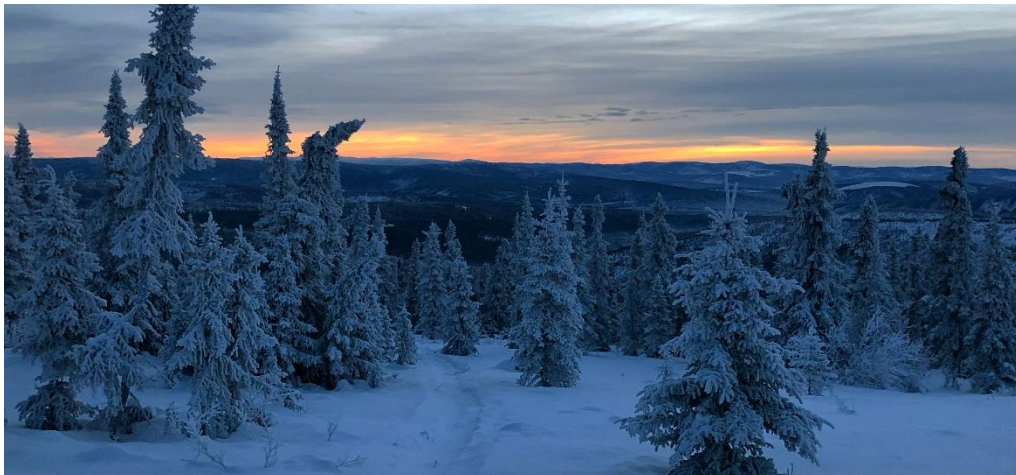
Borough: The geographic area served by the FNSB. See Figure 4 (page 16) of the Existing Conditions Report for a map of the FNSB location and boundary.

Co-benefits: The additional benefits that occur when actions are taken to adapt to or mitigate climate change.

FNSB: Fairbanks North Star Borough, the regional organized municipal corporation serving the area surrounding the cities of Fairbanks and North Pole. Organized boroughs are considered general-law local governments, meaning that they derive their powers from laws enacted by the state legislature. Second-class boroughs like the FNSB must generally gain voter approval for authority to exercise many non-areawide powers.

Goal: A specific target that guides decisions and actions toward achieving the vision.

Mitigation: Strategies that reduce the climate impacts of FNSB operations by reducing greenhouse gas emissions that contribute to a warming climate and by fostering enhanced carbon dioxide removal from the air by ecosystems.



Priority: Climate strategies are ranked high, medium, or low based on how pressing the threat they address is, whether or not they are necessary precursors for subsequent actions in the plan, and how critical they are to meeting related goals. Strategies determined to be the most feasible for the FNSB to carry out are also assigned a higher priority.

Relative Cost: Relative costs are compared to other potential actions included in the plan.

- → **Low cost**: A relatively low cost compared to other potential actions. *Example: Policy changes or state-level advocacy.*
- → **Medium cost**: A medium cost compared to other potential actions. *Example: Minor infrastructure or changes to existing programs.*
- → High cost: A relatively high cost compared to other potential actions. *Example: Extensive infrastructure changes.*
- → Initial cost: An immediate cost at the time an action is taken. *Example: Efficiency upgrades have a higher upfront cost.*

Long-term cost: A recurring cost as a result of taking a specific action. *Example: Efficiency upgrades have a lower long-term cost due to energy savings.*

Strategy: An approach to achieving a specific goal.

Timeframes:

- → Ongoing: already occurring
- → Immediate: to begin at plan adoption, expected early 2023
- → Short-term: plan adoption to January 2025
- → Mid-term: 2025 to 2030
- → Long-term: 2030 to 2050

Vision: An aspirational description of the overall future conditions that we wish to achieve.

Introduction

The FNSB Climate Action & Adaptation Plan (CAAP) is about preparing for and mitigating climate change to protect the health, safety, and well-being of borough residents.

The CAAP is focused on FNSB operations and facilities but will hopefully act as a catalyst to spur and support additional grassroots community-wide action on climate change.

High-level climate action goals of the CAAP are to:

1. Adapt FNSB operations to climate change by increasing their resilience to new climate risks with the goal of maintaining or improving the safety, livelihood, and quality of life of borough residents and businesses.

2. Reduce FNSB costs, local air pollution, and impacts on climate by decreasing energy use and carbon emissions from FNSB operations, with the goal of cutting annual carbon emissions by 5 to 6%.

3. Inform, incentivize, and coordinate with borough residents, businesses, and non-FNSB institutions to pursue opportunities for climate adaptation and mitigation that are beyond the scope of FNSB authority.

Specific CAAP visions, goals, and strategies are organized into eight sectors relevant to climate mitigation and adaptation for FNSB facilities and operations.

The climate-change context, vision, goals, and strategies are presented for each sector to guide climate actions. The goals and strategies provide general guidance to the FNSB as a framework of possibilities. The plan allows FNSB staff the flexibility to decide which of these actions to implement, based on FNSB authority and their understanding of feasibility, cost-effectiveness, grant opportunities, impacts on FNSB operations, and the needs of residents and businesses. The recommendations for each sector are based on detailed suggestions provided by public input (Appendix E) and vetted with FNSB staff for consistency with FNSB authority.

Incorporation of these recommendations into an FNSB plan provides a platform from which the FNSB can more effectively apply for federal grants to fund specific actions. Actions are prioritized by their likely impact, feasibility, and cost-effectiveness, as evaluated by the CAAP planning team. Implementation of some strategies would require FNSB Assembly action, and others are within the bounds of current FNSB department policies or could be supported and implemented through community partnerships. Strategies and actions selected for implementation would likely be refined and continue to evolve as conditions change.

Along with pursuing the high-level goals of the CAAP, implementation of the plan can bring about many *co-benefits*, discussed in the next section.

What Are Climate Action Co-Benefits?

Co-Benefits:

Co-benefits are the additional benefits that occur when actions are taken to adapt to or slow climate change. Examples of co-benefits are human and ecosystem health benefits like cleaner air; economic benefits like job growth into new renewable energy industries; and social benefits like broader equity and inclusion through climate planning processes and policies that support and celebrate diversity.

Human Health

Ecosystem Health

Jobs & Prosperity

Equity & Inclusion

Human Health

Climate change threatens both public health and the health and well-being of individual community members in many ways (Yoder, 2018). If immediate climate actions are not taken, the community will be at heightened risk for poor health outcomes of climate change impacts, including, for example, acute and chronic diseases such as asthma caused by poor air quality (McLaughlin and Castrodale, 2010), heat stroke because of excessive heat days, and injury as a result of extreme weather events. CAAP strategies target ways to improve emergency response programs and make land management decisions that protect communities from natural hazards such as storms, flooding, and wildfires. Protecting residents from climate-related changes will also improve public health conditions in the borough.

Coal plants, vehicle emissions, and wood-burning stoves, for example, all emit greenhouse gases (GHGs) and contribute to unhealthy air quality in the Fairbanks area. Strategies that promote energy efficiency, expand renewable energy, and reduce transportation emissions will also improve air quality and help create a healthier environment for residents. Climate action strategies can also help support healthier lifestyles, for example, by providing better infrastructure for commuting via active transportation modes like biking and walking.

Ecosystem Health

Ecosystem health is directly tied to climate and human health. Climate change is already noticeably altering local ecosystems in Interior Alaska (Thoman and Walsh, 2019). Climate mitigation strategies in this plan and aligned global mitigation strategies are crucial to maintaining a livable environment as the climate warms.

Aquatic and terrestrial ecosystems in the borough provide natural resources that are important to subsistence lifestyles, the borough's economy, and community well-being. Local Indigenous peoples have a long history of interacting closely with the environment and developing strategies for resilience and adaptation. The CAAP encourages Indigenous partnerships to facilitate the incorporation of this knowledge, which can support healthy ecosystems and a resilient community, into FNSB actions.

Many strategies within the CAAP also have benefits for ecosystem health. For example, forests and wetlands store an abundance of carbon dioxide, a powerful GHG. Strategies that aim to reduce development sprawl and the distance that people need to drive may also better protect undeveloped natural areas. Preserving more forests and wetlands can help reduce the amount of carbon dioxide released into the atmosphere and even store more carbon over time. Strategies and actions that protect forests and wetlands from development benefit plants and animals by preserving habitat, and benefit people by providing opportunities for recreation, hunting, and gathering of wild foods.

Jobs & Prosperity

Many fiscal and economic benefits can be experienced by the FNSB and its residents, if actions are taken to mitigate and adapt to climate change. Expanding the clean energy economy will create new career opportunities in the borough and Interior Alaska. Many strategies in the CAAP promote energy efficiency and renewable energy technologies, which have the added co-benefit of creating these new jobs. The CAAP also includes strategies that directly focus on training, re-training, and developing a workforce to carry out a "just transition" to clean energy. These strategies have the co-benefit of economic growth that can lead to an increase in overall community prosperity and economic vitality.

The CAAP also includes general and administrative strategies that will improve the efficiency and effectiveness of FNSB operations. These strategies provide opportunities for the FNSB to cut long term operational costs, ultimately keeping more taxpayer dollars in taxpayer pockets. Without mitigation and adaptation actions, climate change will cause extensive infrastructure damage that requires expensive repairs estimated to potentially be upwards of $500 million (in 2015 dollars) within this century (2015-2099) (Melvin et al., 2017a). Investing in opportunities to adapt existing and new infrastructure to climate change will reduce total costs to the FNSB and taxpayers by avoiding expensive and unexpected repairs and rebuilds in the future (Berman and Schmidt, 2019).

Sustainability Saves Money

A new sustainability plan in Lansing, Michigan is expected to save the city **$1.5 million *per year* for 20 years**! The plan will improve heating and lighting efficiency in several dozen buildings and structures as well as convert city vehicles to electric and hybrid—the CAAP includes many similar strategies.

Read more: bit.ly/LansingBuildings

Equity & Inclusion

Climate change is disproportionately affecting groups who are often the least able to respond and adapt to its impacts, including rural populations (Lal et al., 2011), renters (Dundon & Camp, 2021), the elderly, low-income individuals, communities of color, disabled residents, and homeless and housing-insecure residents (Benevolenza and DeRigne, 2019). If climate planning processes are informed by and center the experiences and perspectives of these groups most impacted by climate change, plans such as the CAAP can raise awareness of and begin to address inequities within the system.

The plan consider ways in which climate change and its impacts may be experienced differently in various areas of the borough, including by urban and rural populations. For example, using the Center for Disease Control and Prevention (CDC) social vulnerability index (2018), the CAAP Existing Conditions Report (pages 19-20) provides maps illustrating different levels of social vulnerability to potential impacts based on four factors—socioeconomic status, household composition and disability status, minority status and language, and housing type and available transportation modes. The Existing Conditions Report also maps out key critical facilities and services, including public parks and bus routes, to provide a baseline understanding of how these resources are geographically dispersed across the borough (pages 23-27). Lastly, the Public Participation Involvement Chapter includes an outreach list of organizations and businesses that serve both urban and rural populations across the FNSB (pages 10-13). Ensuring that climate-action strategies benefit all community members and sufficiently protect residents who are most threatened is crucial for achieving climate adaptation and mitigation goals.

Climate Action Recommendations by Sector

CAAP visions, goals, and strategies are organized into eight sectors relevant to climate mitigation and adaptation for FNSB facilities and operations.

High-priority recommendations are preceded by "HP" and medium-priority by "MP." Additional ideas for future strategies can be found in the Summary of Strategies and Ideas from Public Input (Appendix E). An overall guiding vision for the plan was also developed based on community input.

Overall Vision

The Fairbanks North Star Borough (FNSB) is an inclusive, resilient, and healthy place to live where community members are prepared for climate-related changes and enjoy economic opportunities, a high quality of life, and personal freedoms. Safe and connected neighborhoods, efficient multi-modal transportation, equitable access to education and jobs, and healthy ecosystems are valued and protected for current and future generations.

General & Administrative

The General and Administrative sector addresses goals and strategies that apply across multiple departments of the FNSB organization. Strategies in this sector (e.g., hiring a grant writer) will benefit government operations overall while also providing funding and support for climate actions. Implementing and tracking goals and strategies in this sector broadly rely on assessing the most cost effective strategies for decarbonization through an updated emissions inventory, the last of which was done in 2007. Informing, incentivizing, and coordinating with groups outside of the FNSB government will facilitate the achievement of adaptation and mitigation goals that are beyond the scope of FNSB authority.

Vision

The Fairbanks North Star Borough (FNSB) government protects the health, safety, and well-being of its residents and the environment. Its operations adapt to climate change through science- and community-informed policies and actions that maintain the resilience and sustainability of the Fairbanks community. FNSB operations are well coordinated across departments to improve service delivery and reduce energy use in ways that are cost-effective and minimize negative impacts on local air quality and climate warming.

General & Administrative

Goals & Recommendations

Goal 1.1

Adapt FNSB operations to climate change to improve the safety, livelihood, and quality of life of borough residents and businesses.

HP 1.1.A Identify co-benefits and tradeoffs of climate actions with other FNSB goals, as identified in current FNSB plans, and plan a strategy for implementing recommended climate adaptation and mitigation actions.

$ Low Cost

High Priority

HP 1.1.B Hire a full-time grant writer at the FNSB to assist various departments in applying for state and federal funds for the implementation of climate action strategies and initiatives, and coordinate the planning of climate actions across departments.

$$$$ High Initial/Low Long-Term Cost

High Priority

HP 1.1.C Clarify the processes by which the FNSB and other groups (e.g., tribes, cities, non-profit organizations, military, businesses) can collaborate to seek funding for climate actions that benefit FNSB operations and the broader community.

$ Low Cost

High Priority

General & Administrative

Goals & Recommendations

MP 1.1.D Access technical assistance, grant opportunities, resources, and training for climate mitigation and adaptation by becoming a member of International Council for Local Environmental Initiatives (ICLEI) Local Governments for Sustainability.

$ Low Cost

⚠⚠ Medium Priority

MP 1.1.E Publicly track climate-change metrics related to FNSB operations such as how early or late plowing begins and ends, changes in road maintenance and energy costs, annual temperature and precipitation patterns, and frequency of extreme weather events. Use these metrics to estimate costs and benefits of different potential climate actions and to pursue grant opportunities.

$ Low Cost

⚠⚠ Medium Priority

Goal 1.2

Acquire the data and resources needed to reduce the FNSB's energy use and associated costs and impacts on climate.

HP 1.2.A Develop a science-based, GHG-reduction goal for FNSB operations and for the borough as a whole.

$ Low Cost

⚠⚠⚠ High Priority

HP 1.2.B Summarize current annual fuel and electricity use by FNSB operations as a basis for estimating its annual carbon emissions and tracking its desired annual reductions in energy use.

$ Low Cost

⚠⚠⚠ High Priority

General & Administrative

Goals & Recommendations

HP 1.2.C Coordinate with an external entity (e.g., Alaska Center for Energy and Power, Cold Climate Housing Research Center, the University of Alaska – Fairbanks [UAF]) to estimate current carbon emissions as a benchmark for developing detailed alternatives to reduce future emissions.

$$ Medium Cost

!!! High Priority

HP 1.2.D Engage other groups (e.g., Native organizations, NGOs, businesses, unions, the military, city governments, state and federal programs, and groups of residents) to foster climate actions that equitably reduce carbon emissions and meet the needs of diverse groups.

? Uncertain Cost

!!! High Priority

Buildings & Energy

Vision

Buildings are safe and healthy places for residents to live, work, and play. Energy use for heating, electrical, and transportation needs is dramatically reduced through efficiency and conservation. Community members and businesses have equitable access to affordable, high-quality, energy-efficient buildings and homes, and clean renewable energy that is reliable year round.

The goals and strategies of the Buildings and Energy sector support optimizing energy conservation and the efficiency of buildings while also transitioning to renewable energy sources for transportation, electricity, and heat. During the past 10 years, the FNSB has reduced its electricity usage by 18% through energy efficiency and conservation upgrades (see Existing Conditions Report Figures 23 and 24 [pages 72-74] for more on FNSB energy use and costs). Because electricity produced by Golden Valley Electric Association (GVEA) and used by the FNSB is largely fossil fuel based, GVEA's proposed transition to more renewable energy is important to reducing GHG emissions of FNSB operations and the broader community. The CAAP addresses this by including strategies that support advocating locally with GVEA and at the state level for policies that foster a transition to renewable energy, partnering with local experts to pilot and expand renewable technologies in FNSB facilities, and participating in the Railbelt Reliability Council to advocate for more electricity produced from renewable sources.

Natural gas service in the borough is currently limited to the most densely developed areas in the cities of Fairbanks and North Pole. The CAAP recommends optimization of the natural gas system in this existing distribution infrastructure but does not recommend a broad expansion of this service. An expansion of natural gas infrastructure would lock the borough into continued dependence on fossil fuels that have uncertain future supply and price fluctuations rather than transitioning to cleaner renewable energy—such as solar, geothermal, and wind—whose costs will likely decline over time.

Building & Energy

Goals & Recommendations

Goal 2.1

Reduce energy costs of FNSB operations by improving design standards and shifting from fossil fuels to renewable energy where feasible and cost effective in the long term.

HP 2.1.A

Reduce energy use, costs, air pollution, and climate impacts of current FNSB operations and future buildings and retrofitted infrastructure by identifying the largest opportunities for emission reductions and implementing the changes that would most improve these metrics. Track and report annually on energy use and cost metrics.

$$$ High Cost

High Priority

HP 2.1.B

Shift from fossil fuels to renewable energy, where feasible, to reduce dependence on costly energy sources, have significant effects on climate, and have uncertain future costs and availability. For example, develop a process, implementation plan, and timeline to facilitate the installation of solar panels at those FNSB facilities where they are cost effective in the long term.

$$$$ High Initial/Low Long-Term Cost

High Priority

HP 2.1.C

Prioritize decarbonization and renewable energy generation and storage at FNSB facilities in the long term while maintaining current liquid natural gas heat and energy generation systems for short-term backup power during grid outages.

$$$$ High Initial/Low Long-Term Cost

High Priority

Building & Energy

Goals & Recommendations

MP 2. 1.D Develop and implement goals and timelines for electrification of borough facilities and track and report accomplishments annually. Foster electrification through participation in the Railbelt Reliability Council.

$ Low Cost

Medium Priority

MP 2.1.E Determine the feasibility and practicality of small-scale battery energy storage systems and solar panels on borough facilities as a backup energy source during grid outages.

$$$$ High Initial/Low Long-Term Cost

Medium Priority

Goal 2.2

Promote energy savings by residents and businesses through incentives and advocacy of state support for improved design standards and funding for renewable energy.

HP 2.2.A Incentivize improved designs that conserve energy and save money in private residences and businesses in the FNSB. For example, establish and implement a Residential Property Assessed Clean Energy (R-PACE) and Commercial Property Assessed Clean Energy (C-PACE) Program for the FNSB to encourage home and business owners to install renewable energy systems, energy and water efficiency, and conservation upgrades

$$ Medium Cost

High Priority

Building & Energy

Goals & Recommendations

HP 2.2.B Advocate at the state level for passage of laws that incentivize energy efficiency improvements and support affordable financing for clean energy in Alaska.

$ Low Cost

High Priority

MP 2.2.C Collaborate with local businesses and research groups to explore energy conservation innovations (e.g., heat pumps, re-use of waste heat) that reduce emissions, improve air quality, and create long-term cost savings.

$$ Medium Cost

Medium Priority

MP 2.2.D Identify ways to support tax, grant, and other assistance to low-income residents for energy conservation upgrades.

$ Low Cost

Medium Priority

Transit & Mobility

Climate change and its impacts (such as accelerating permafrost thaw, increased flooding, and erosion) threaten the performance, maintenance cost, and longevity of roads. Several studies have estimated the cost of climate change-related infrastructure damage in Alaska (Berman and Schmidt, 2019), with one including estimates specifically for the FNSB (Melvin et al., 2017a). Berman and Schmidt (2018) estimate that infrastructure damages caused by climate change could impose an annual net cost of $340 to $700 million statewide. (This study also accounted for potential economic benefits of climate warming in its analysis of net costs, for example, growth in the agricultural sector due to longer growing seasons and warmer winters.) Melvin et al. (2017a) estimated that total cumulative damages caused by climate change in the FNSB could be greater than $500 million (in 2015 dollars) within this century (2015-2099). This study also concluded that the FNSB is one of the most susceptible regions in Alaska to climate change-related infrastructural damage; however, the FNSB stands to gain considerable benefits from taking proactive adaptation measures, with the potential to reduce estimated damages by $286 million. The CAAP addresses adaptation strategies that will improve the maintenance and resilience of the road system in the face of these climate change-related costs and risks.

Vision

All community members regardless of age, economic status, or ability are able to get to their places of work, essential services, and recreation in convenient, affordable, and sustainable ways. The transportation system is equitably connected and provides many options for reliable, affordable, and low-carbon modes such as walking and biking, carpooling, ride-sharing, and public transportation. Forward-thinking road design and construction standards ensure that the transportation network remains resilient to climate change impacts.

Transit & Mobility

Goals & Recommendations

The 2007 borough-wide carbon emission inventory found that the transportation sector accounted for 11% of total generated emissions within the geographic area of the borough (pages 8 and 20 of Holdmann and Murphy, 2008). The Transit and Mobility sector (including non-military traffic by on road vehicles, the Alaska Railroad, and airplanes fueling at Fairbanks International Airport) of the CAAP includes goals and strategies to reduce FNSB operations' transportation related emissions by gradually transitioning the FNSB fleet to hybrid and electric vehicles. This transition also has co-benefits of reducing local air pollution and improving long-term cost-effectiveness by reducing dependence on price-volatile fossil fuels. The CAAP also recommends improving pedestrian, bike, and public transit infrastructure to provide borough residents with additional low-emission transportation options.

Electric Vehicles Lower Emissions

The net emissions of EVs are almost always lower than those of internal combustion engine vehicles, but *how much lower* depends on the energy mix used to charge the EV. EVs make the biggest difference when charged with electricity produced from renewable energy sources.

Regardless of energy mix, however, EVs do not produce tailpipe emissions, meaning **they do not contribute to local air pollution.**

Read more: bit.ly/m/EV_FactSheet

Transit & Mobility

Goals & Recommendations

Goal 3.1

Reduce the vulnerability of roads and infrastructure to climate-change impacts and ensure that sidewalks and public transportation facilities are safe and accessible to users of all abilities year round.

HP 3.1.A Improve the resilience of roads and infrastructure by identifying locations of greatest climate-change vulnerabilities and developing design and maintenance strategies that minimize climate-change impacts such as those related to permafrost thaw and winter icing events.

$ Low Cost

!!! High Priority

HP 3.1.B Ensure that sidewalks and public transportation facilities are safe and accessible to users of all abilities year round through coordination with the City of Fairbanks, City of North Pole, Fairbanks Area Surface Transportation (FAST) Planning, and Alaska Department of Transportation and Public Facilities (DOT&PF).

$$ Medium Cost

!!! High Priority

Transit & Mobility

Goals & Recommendations

Goal 3.2

Reduce transportation-related carbon emissions.

HP 3.2.A Reduce air pollution and long-term costs by transitioning FNSB and FNSB-contracted vehicles to hybrid and electric other low-emissions vehicles, prioritizing those changes that provide the greatest long-term cost savings and reduction in air pollution and carbon emissions. Develop the capacity to maintain and repair these vehicles.

$$$ $ High Initial/Low Long-Term Cost

!!! High Priority

HP 3.2.B Provide and maintain electric vehicle charging stations at borough facilities, schools, and parks. These are currently fundable through state and federal grants.

$$ Medium Cost

!!! High Priority

HP 3.2.C Implement an idling reduction policy for borough vehicles that is appropriate for the local climate and seasonal conditions.

$ Low Cost

!!! High Priority

MP 3.2.D Reduce commuting-related vehicle emissions by encouraging virtual meetings and remote work option policies (particularly in situations where this saves time and money and does not reduce performance) and incentivizing commuting that uses non-motorized transport or public transportation.

$ Low Cost

!! Medium Priority

Transit & Mobility

Goals & Recommendations

MP 3.2.E	Expand resident access to schools, businesses, and recreation while reducing transportation-related emissions, for example, by improving pedestrian, bike, and transit infrastructure and identifying key routes where public and non-motorized transportation would be used most frequently.	$$	Medium Cost
		⚠⚠	Medium Priority
MP 3.2.F	Support walkability and active transportation modes by updating road design and construction standards—provide bike paths, sidewalks, and separated paths along specific types of roads (e.g., major collectors and roads to key community facilities and commercial hubs).	$$	Medium Cost
		⚠⚠	Medium Priority
MP 3.2.G	Install bike racks or other secure bicycle storage at Borough facilities and key destinations to support year round, low-carbon commuting (FAST Planning process).	$	Low Cost
		⚠⚠	Medium Priority
MP 3.2.H	Provide public information about the pollution-reduction and energy-saving benefits of vehicle plug-ins and other personal choices that reduce carbon emissions and costs (see FNSBC 21.24.010 Vehicle plug-in program).	$	Low Cost
		⚠⚠	Medium Priority

Education & Workforce Development

Developing a clean energy workforce will be necessary to transition to renewable sources and reduce GHG emissions on a large scale. Research has shown that investing in renewable energy and energy efficiency creates more jobs on average than investing the same amount of money in fossil fuels (Garrett-Peltier, 2017). Additionally, workers in clean energy have proven to earn higher and more equitable wages on average compared to all workers nationally, even while educational requirements for entering the field are lower on average compared to other industries (Muro et al., 2019). A well-trained workforce will be necessary to carry out many of the strategies within the Buildings and Energy sector of the CAAP. Community partnerships with labor unions, UAF, and the UAF Technical College present strategic opportunities to train and re-train workers to expand this skilled workforce.

Public access to information and education about current and expected climate change is important for achieving climate action goals. Providing accurate information about climate change can encourage individuals to reduce their carbon footprints. This information is also a lifeline for residents and businesses to better prepare for and adapt to unavoidable climate changes that will directly affect them. A number of CAAP strategies outline ways to provide resources and training to residents, business owners, and the general public on climate-change adaptation and mitigation.

Vision

Economic activity in the borough meets the needs of residents without reducing opportunities for people in the future. Development decisions are driven by climate-change adaptation and mitigation, yielding new economic and educational opportunities for workers. Community members have equitable access to continuing education, workforce retraining, and youth learning opportunities to support a just transition to clean energy.

Education & Workforce Development

Goals & Recommendations

Goal 4.1

Develop a workforce supportive of climate-change adaptation and mitigation.

HP 4.1.A Support business and trade-school education and training programs that teach job skills and provide career training in fields supportive of climate-change adaptation and mitigation.

$ Low Cost
High Priority

HP 4.1.B Incentivize expansion and job creation in climate-friendly industries (e.g., renewable energy, small-scale agriculture, northern eco-tourism, and outdoor recreation) by engaging local businesses, unions, and workers.

$ Low Cost
High Priority

Goal 4.2

Educate the public on ways to reduce their climate vulnerability and carbon emissions.

HP 4.2.A Provide public information—through written materials and the borough website—on best practices for reducing waste, air pollution, wildfire, flood, and permafrost thaw risks.

$$ Medium Cost
High Priority

MP 4.2.B Explore partnerships and funding opportunities to provide information and training to large facility operators (e.g., hotels and other businesses) about the use of energy- and water-saving devices and technology.

$ Low Cost
Medium Priority

Food & Agriculture

Today, Alaska produces only 5% of the food consumed by its residents, down from 55% in 1955 (USDA, 2022). The reliance on imported food makes the FNSB community particularly vulnerable to disruptions in the global and national food supply chains. Climate change will exacerbate Alaska's susceptibility to food supply disruptions, as the frequency of large storms and droughts increases in today's major agricultural regions. On the other hand, climate warming is expected to offer new opportunities for local agriculture as a result of longer growing seasons and warmer winters (Fresco et al., 2021). Expanding local agriculture opportunities, as well as local storage and distribution capacity, will make the food system more resilient. Increasing local agriculture can also decreases demand for imported foods and reduce transportation-related GHG emissions.

A variety of local food system-focused programs already exists in the borough, led primarily by community-based organizations and university partnerships. These programs focus on providing food to community members in need, organizing community gardens, and piloting new crop varieties and growing practices suited to the local environment. Supporting the work of these groups and partnerships will also strengthen local food system resilience in the borough.

Vision

Community members have access to healthy, affordable, and culturally appropriate foods through resilient grocery supply chains, locally harvested wild foods, food preservation and storage infrastructure, and locally supported small to mid-scale agricultural producers.

Food & Agriculture

Goals & Recommendations

Goal 5.1

Improve food security and increase access to locally sourced food.

HP 5.1.A Explore food and agriculture opportunities that arise from climate warming through partnerships and coordination with the FNSB Sustainability Commission, UAF, Cooperative Extension Service, and community-based non-profits.

$ Low Cost

!!! High Priority

HP 5.1.B Continue to support the work of community organizations to clothe and feed vulnerable residents with pass-through grants for programs such as food pantries and community gardens.

$$ Medium Cost

!!! High Priority

HP 5.1.C Increase access to locally sourced foods by encouraging (e.g., through tax incentives) the development of local food storage and distribution centers and advocating at the state level for a USDA food warehousing facility.

$$ Medium Cost

!!! High Priority

Food & Agriculture

Goals & Recommendations

Goal 5.2

Encourage the development of sustainable agricultural land uses.

HP 5.2.A Identify and protect from development FNSB lands with high potential to combine agriculture with soil carbon storage.

$ Low Cost

High Priority

HP 5.2.B Identify and protect lands close to urbanized areas that simultaneously protect developments from wildfire and support community gardening, harvest of wild foods, and habitat conservation.

$ Low Cost

High Priority

HP 5.2.C Advocate at the state level for policies that better support sustainable agricultural practices and small- to middle-scale agriculture within the borough.

$ Low Cost

High Priority

Health & Emergency Services

Vision

The community lives in a healthy environment and is prepared for climate-related and other disasters through proactive emergency preparedness and coordinated emergency services.

Projected increases in wildfires threaten structures, the safety of residents, and fire control personnel. As the need for fire protection and suppression expands, so will its cost. One study found that, based on climate projections, wildfire suppression costs in Alaska could increase by $25 million per year (in 2015 dollars) (Melvin et al., 2017b). These costs will also continue to rise if the populated area requiring fire suppression continues to expand. Increases in wildfire smoke also pose a far-reaching public health concern, adding to the Fairbanks area's existing air-quality issues. Poor air quality and wildfire smoke disproportionately affect those with preexisting and chronic health conditions such as asthma, and vulnerable populations such as low-income residents, the elderly, and the unhoused. Several CAAP strategies address the increasing threat of wildland fire and smoke, and related health impacts, on the borough community.

To be eligible to receive Federal Emergency Management Agency (FEMA) hazard mitigation funding, the FNSB must develop a Hazard Mitigation Plan and update it every 5 years. Fairbank's Multi jurisdictional Hazard Mitigation Plan (MJHMP) profiles natural hazard risks, including flooding, wildfires, and permafrost thaw, and provides recommendations to ensure the FNSB emergency response program is prepared to mitigate risks and effectively respond. Hazard mitigation planning is a crucial aspect of climate change adaptation and preparedness. Using the most up-to-date climate change data will be essential for updating the MJHMP as conditions change, a fact that is reflected in several strategies in this sector.

Heath & Emergency Services

Goals & Recommendations

Goal 6.1

Improve the resilience of emergency services and protect the safety of lives and property by reducing climate-related risks.

HP 6.1.A Improve the resilience of emergency services, communication, and management to climate-change risks such as wildfire, flooding, and permafrost thaw.

$$ Medium Cost
!!! High Priority

HP 6.1.B Identify and prioritize the protection of vulnerable (e.g., elderly, poor, and disabled) residents from climate-related risks such as power outages, extreme heat, poor air quality, and wildfires. Integrate these analyses into updated emergency response maps and the MJHMP.

$$ Medium Cost
!!! High Priority

HP 6.1.C Ensure adequate protection of neighborhoods from fire and flooding, as well as emergency-service access to neighborhoods in the event of fires and other emergencies, for example, by updating road and subdivision standards.

$ Low Cost
!!! High Priority

HP 6.1.D Explore best practices for reducing wildfire risks near developed lands, for example, by removing beetle-killed trees that would also provide an affordable local wood supply for home heating and by encouraging beneficial non-forested land uses (e.g., recreation, agriculture, harvest of wild foods).

$ Low Cost
!!! High Priority

Heath & Emergency Services

Goals & Recommendations

Goal 6.2

Reduce health risks by improving air quality.

HP 6.2.A Reduce health risks by improving air quality that has declined because of wildfire and local air pollution.

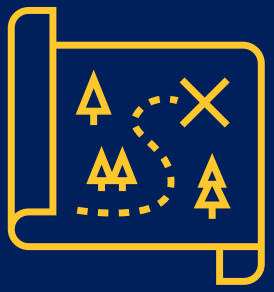
$$ Medium Cost

!!! High Priority

HP 6.2.B Improve indoor air quality in borough buildings and community facilities, prioritizing buildings that could serve as public “safe spaces” during unhealthy air-quality periods and other extreme weather events.

$$$$ High Initial/Low Long-Term Cost

!!! High Priority



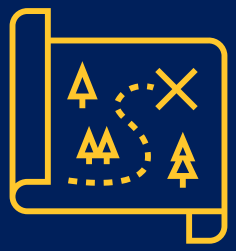
Planning & Land Use

By exercising its planning, platting, and land-use powers, the FNSB can minimize risks to life and property from natural disasters. For example, the FNSB can promote developments that have a lower probability of wildfire and flooding. Road systems that allow emergency-service access in the event of a disaster can also reduce carbon emissions by providing efficient routes for public transportation and non-motorized forms of travel. Improving access and increasing the efficiency of the transportation system can also reduce overall maintenance and development costs borne by the community (Litman, 2015).

Land-use strategies in the CAAP generally discourage development in areas such as wetlands where surface subsidence from permafrost thaw makes road and infrastructure maintenance difficult. Such lands may provide the greatest public benefit as fuel breaks to protect against wildfires and as sources of wild foods (e.g., berries, wildlife habitat) and storage of carbon.

Vision

Sustainable land planning supports safe development that minimizes exposure to climate-related risks including wildfire, permafrost thaw, and flooding; agriculture, recreation, wildlife habitat conservation, and carbon storage on lands that are unsafe for infrastructure; and equitable access of borough residents to amenities, businesses, and services by motorized and non-motorized transportation.



Planning & Land Use

Goals & Recommendations

Goal 7.1

Ensure safe development that minimizes exposure to climate-related risks such as wildfire, permafrost thaw, and flooding; and support agriculture, recreation, wildlife habitat conservation, and carbon storage on lands that are unsafe for development.

HP 7.1.A As a policy, include an analysis of climate change related impacts and of associated adaptation and mitigation responses into all long-range FNSB plans, studies, and strategies.

$ Low Cost
High Priority

HP 7.1.B Prioritize non-urban land sales and developments that minimize exposure to climate change-related risks such as wildfire, flooding, and permafrost thaw.

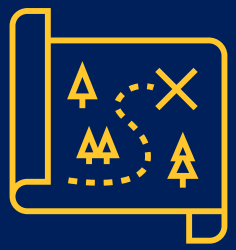
$ Low Cost
High Priority

HP 7.1.C Prioritize lands for conservation that are unsuitable for development because of high risks of wildfire, flooding, and permafrost thaw but have high value for habitat conservation, carbon storage, and harvest of wild foods. Explore partnerships with local organizations to manage these lands for public recreational benefit.

$ Low Cost
High Priority

HP 7.1.D Protect existing structures and discourage future development in flood-prone areas by providing public information about flood risks and flood-resilient building practices and by enforcing floodplain permits and code provisions.

$$$ Medium Initial/Low Long-Term Cost
High Priority



Goals & Recommendations

HP 7.1.E Update the FNSB's stormwater management standards, including stormwater design requirements, to improve resilience against climate-change impacts that involve larger and more frequent precipitation events.

$$ Medium Cost
!!! High Priority

Goal 7.2

Ensure equitable access to amenities, businesses, and services by motorized and non-motorized transportation.

HP 7.2.A Work with the cities of Fairbanks and North Pole to revitalize the urban core of the FNSB by providing equitable access to amenities, businesses, housing, and services; an environment that is attractive, healthy, and safe for residents and businesses; and roads and walkways that are pedestrian and bicycle friendly.

$$ Medium Cost
!!! High Priority

MP 7.2.B Prioritize land sales that allow safe, economical access by motorized and non motorized transportation. (Low cost, Medium priority)

$ Low Cost
!! Medium Priority

MP 7.2.C Estimate and map the economic value of ecosystem services such as carbon sequestration on undeveloped Borough lands, so this information can be considered when evaluating parcels for FNSB land sales. (Medium cost, Medium priority)

$$ Medium Cost
!! Medium Priority

Waste Management & Recycling

The FNSB runs a borough-wide waste management program that comprises decentralized transfer sites, contracted waste hauling services from those sites, and landfill operations, including planning and construction. Strategies intended to reduce the amount of waste generated and improve the efficiency of waste management programs can reduce carbon dioxide and methane emissions. The CAAP also targets ways to increase the use and improve the efficiency of the FNSB recycling program.

Waste-to-Energy Energy in Homer, AK

Homer Electric Association is moving forward with a project that will use the methane gas produced at the Central Peninsula Landfill into usable energy. A local source of biogas means **buying less natural gas** - better for the bottom line and the environment! The CAAP recommends a similar project for the FNSB Landfill.

Read more: bit.ly/MethaneHEA

Vision

FNSB procurement and operations reduce excess waste and support cost-effective recycling and reuse of local materials to minimize the health and environmental impacts of unavoidable waste. Community members have equitable and convenient access to recycling and reuse services. FNSB procurement prioritizes local manufacturers, vendors, and small businesses to minimize the carbon footprint of purchasing and support the local economy.

Waste Management & Recycling

Goals & Recommendations

Goal 8.1

Reduce excess waste and energy use.

HP 8.1.A Develop a cost analysis and implement a procurement policy to reduce the purchase and usage of single-use plastics at FNSB-operated sites, including its offices, its public facilities, and the school district. Ensure equitable accommodations are made for those who rely on single-use plastics.

$$ Medium Cost

!!! High Priority

MP 8.1.B Support and incentivize energy-saving improvements that could be implemented at the wastewater treatment plant.

$ Low Cost

!! Medium Priority

MP 8.1.C Encourage the school district to conduct a food waste audit to inform future food-purchasing decisions.

$ Low Cost

!! Medium Priority

Goal 8.2

Minimize the health and environmental impacts of unavoidable waste.

HP 8.2.A Determine the feasibility of a borough-wide composting program for both residential and food-service food waste.

$ Low Cost

!!! High Priority

Waste Management & Recycling

Goals & Recommendations

MP 8.2.B Continue to expand, upgrade, and improve the FNSB recycling program and facilities, especially where recycled materials provide economic value to Fairbanks businesses and residents.

$$ $ Medium Initial/Low Long-Term Cost

High Priority

MP 8.2.C Advocate at the state level for the development of extended producer responsibility initiatives for various waste-producing industries statewide.

$ Low Cost

Medium Priority

MP 8.2.D Determine the feasibility of using waste methane from the landfill as fuel and of using retired cells at the landfill as a site for solar panels.

$$$ $ High Initial/Low Long-Term Cost

Medium Priority

MP 8.2.E Assess the feasibility and cost of placing recycling bins at transfer stations, FNSB facilities, and densely populated neighborhoods (via curbside pickup).

$$$ $ High Initial/Low Long-Term Cost

Medium Priority

MP 8.2.F Encourage the incorporation of recycling and food waste concepts and strategies into borough libraries' educational programs for children and adults.

$ Low Cost

Medium Priority

Conclusion

The goals and recommended strategies in this chapter were developed and refined based on the following:

1. Extensive public input and guidance from the Assembly Climate Action Committee
2. Evaluation of best practices and beneficial strategies implemented in other northern communities similar to the FNSB
3. Local conditions analysis from consultation with local experts in climate adaptation and the Background Chapter and Existing Conditions Report
4. Outcomes from the risk analysis framework applied in the PESTEL Chapter

Chapter 5, Evaluation Framework: Implementation & Monitoring, lays out a high-level path forward to help FNSB department and division staff identify next steps for climate actions. FNSB staff will apply their expertise in determining which strategies are the most cost effective, feasible, and impactful for their departments to pursue. The Evaluation Framework chapter also provides guidance on roles and responsibilities for carrying out recommendations in the plan, mechanisms for implementing actions, and a communications plan outlining recommendations for annual progress reporting, an online dashboard tool, and metrics and indicators for tracking progress.

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