ANCHORAGE WILDFIRE

Dare to Prepare!

Program Report
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www.muni.org/fire1/wildfire.cfm

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Partnering Agencies

Alaska Department of Natural Resources
- Division of Forestry
- Chugach State Park

Alaska Division of Emergency Services
Alaska State Fire Marshal
Anchorage Soil & Water Conservation District
Bureau of Land Management & Alaska Fire Service
Elmendorf Air Force Base
Federal Emergency Management Agency Region X
Fort Richardson
Municipality of Anchorage
- Anchorage Fire Department
- Anchorage Police Department
- Community & Economic Development
- Cultural & Recreational Services
- Heritage Land Bank
- Information Technology Department/GIS Division
- Office of Emergency Management
- Solid Waste Services

University of Alaska Fairbanks
- Cooperative Extension Service
- School of Natural Resources & Agricultural Sciences

USDA Forest Service Region 10
- Chugach National Forest
- Pacific Northwest Research Station
- State & Private Forestry

USDA Natural Resources Conservation Service
USDI National Park Service

ANCHORAGE WILDFIRE: Dare to Prepare!

Executive Summary

Since 2001, the Anchorage Fire Department and multiple partnering agencies have worked tirelessly to mitigate the risks and hazards of wildfire impacting the community values within the Municipality of Anchorage. During the past three years, this program has delivered educational programs to Anchorage area residents on preparedness, taken an active role in reducing the *"forest fuels"* throughout parks and residential areas, and improved training and response capability of the Anchorage Fire Department with respect to wildland-urban interface fire. Congressional funding of over $12 Million supports these programs that have dramatically increased the level of preparedness for wildfire among residents and emergency responders. The enclosed report describes these programs and highlights wildfire mitigation and preparedness efforts in our community.

While the initial funding request submitted to Congress in 2001 established a 3-phased program over 10 years requiring $42 million for completion, modifications to the program have occurred that reflect lessons learned within and outside of our community. Through achieving initial programmatic objectives, AFD recommends a reduced total budget of $17,500,000. Beyond the 10-year implementation timeline, the Municipality of Anchorage plans to incorporate the maintenance of the wildfire mitigation program in its operating budget. Due to State and Municipal economic restraints, wildfire projects cannot be funded locally at this time. Based on the cumulative funding received to date, the Anchorage Fire Department is requesting an additional $5,000,000 to support the continuation of the program through 2011. Identified herein are methods for local financial support of the program that are being transitioned into current operations for operational continuity subsequent to the federal funding allowance.

Through phase III of the program, institutional changes within the community can be solidified through the establishment of Firewise Communities and long range maintenance of forest health. The Anchorage Fire Department is committed to supporting wildfire prevention and response in its training and operational capacity.

Anchorage Fire Department's Mission

Prevent all harm, Survive All Risk, Be Nice.

Anchorage Wildfire Mitigation Program's Mission

Empower Anchorage to be prepared, respond effectively, and assist homeowners to mitigate the risk of wildfire in our community. Together we can make Anchorage Firewise.

Our Vision for a Firewise Anchorage

- Anchorage Fire and Police Departments are prepared for a wildfire and can respond quickly and safely without loss of life of responders and the public
- Anchorage residents are Firewise, have created a home defensible space and prepared a family evacuation plan
- Public land managers and homeowners are stewards to the land by promoting forest and ecosystem health: active forest management and backyard conservation are used to keep Anchorage's forests green not dead.

Program Goals

- Aggressive hazardous fuel reduction of spruce beetle killed trees on public lands and private lands through homeowner assistance programs
- Anchorage residents are knowledgeable about their risk to wildfire and know the Firewise principles of defensible space and emergency evacuation procedures
- Firewise Communities foster neighborhood cohesion as neighbours unite to prepare for a wildfire with minimal property loss
- Municipal and State mutual aid resources are coordinated to provide effective and timely fire suppression and response for wildfires in the MOA

Program Objectives

Reduce the hazard of wildfire by decreasing the potential for homes to burn

- *remove dead & dying spruce trees*
- *thin dense forests near homes*
- *eliminate ladder fuels*
- *improve defensible space.*

Improve public safety through community partnerships

- *empower with education to take on the responsibility of creating and maintaining a defensible space*
- *create Firewise neighborhoods prepared for emergencies*

Improve emergency preparedness and response capability

- *fire and police wildfire response training*
- *establish alternative water resources*
- *improve fire apparatus access*
- *evacuation planning*
- *coordinated interagency initial attack and fire suppression*
- *improve public emergency information communications*

Decrease the potential for human-caused ignitions

- *school based wildfire education*
- *fuel reduction projects in areas of transient camps*
- *public information regarding fireworks, children playing with matches*
- *effective use of media to support program goals*

The potential for wildfire to spread in the Municipality of Anchorage is real. Many residential neighborhoods are located within forested tracts. Human-caused fires have the potential to spread out of control and expose our community to a catastrophic wildfire event. Through preparedness and mitigation strategies, we can have a wildfire without having an associated residential disaster: if homes don't ignite, they won't burn.

The wildland urban interface fire problem is associated with building homes near vegetation that can carry fire. This problem can be solved by homeowners assuming the responsibility of living with fire. Through human-caused ignitions, brush fires can occur in almost all of our neighborhoods. Whether a fire travels through the dry grasses in spring, through the black spruce bogs in mid summer, or through spruce bark beetle affected stands of white spruce, fire may ignite homes if the conditions for combustion are met. Heat, fuel, and oxygen are required for fire to occur; the materials surrounding a home (building materials, stored equipment under decking, accumulations of organic debris adjacent to exterior walls) have a significant impact on whether homes ignite during a wildfire.

In addition to the fundamental issue of living in forested areas, the spread of the spruce bark beetle (*Dendroctonus rufipennis*) has infested over 3.2 million acres in Alaska. This includes 85,000 acres within the Municipality of Anchorage where 260,000 residents live in the wake of this epidemic. Although the beetle population is waning, the dead and dying spruce trees combined with the natural stand structure of boreal forests increase the potential for wildfire to spread through this community. As documented by the Alaska Region of the USDA Forest Service's State & Private Forestry, Alaska's spruce bark beetle epidemic has been on-going for over a decade, but reached unprecedented levels in the 1990's. State and federal agencies have partnered to study the beetle outbreak and document its progress. During its peak in 1996, researchers estimated that 30,000,000 spruce trees in Southcentral Alaska died from the infestation in that year alone. Through a series of annual aerial mapping surveys, researchers have determined that the acres affected per year are decreasing. Continued monitoring suggests that over 3 million acres have been heavily impacted in the last 15 years by the bark beetle. Long term ecological effects vary by region. In the Anchorage area, the forested acres affected by the bark beetle are experiencing a considerable influx of regenerating spruce along with birch and patches of blue joint grass. As the mature, dead trees fall to the ground, the resulting fuel loading leads to increased fire hazard.

The combination of fuels, topography, and weather places the community in a high risk category for experiencing a wildfire event. Fuels in the MOA refer to both

vegetation and structures. The boreal forest cover type consists of white spruce, black spruce, paper birch, and a variety of understory plants. Stand structure in these forests varies considerably between the dominant overstory tree species and density of tree growth. Some forests will support surface fires while others will also support crown fires.

The risk of wildfire characterizes the potential to ignite: human-caused fires are the most likely source of a fire that escapes control. Hazard is the potential to burn: forests, other vegetation, and the construction materials of structures in the interface contribute to fire fuels. Environmental conditions such as temperature, relative humidity, moisture content and wind contribute to the intensity and spread of fire. Potential for loss is characterized by the economic and aesthetic value of structures, public infrastructure, and natural resources.

Since the early 1990s, staff members from the USDA Forest Service State & Private Forestry, UAF Cooperative Extension Service, Alaska DNR Division of Forestry, and the Anchorage Fire Department have been teaching homeowners and local leaders about the risk of wildfire to the Municipality of Anchorage.

The Municipality of Anchorage has partnered with local, state, and federal agencies to implement strategies to address the threat of wildfire. Through education and preparedness, citizens and emergency responders can act effectively to save life, property, and natural resources during a wildfire event. With funding assistance appropriated through Congress, the Municipality has received the resources to confront this challenge directly. Since 1999, the MOA has received $400,000 from FEMA, been a partner to $710,000 from a State Fire Assistance Grant to the Anchorage Soil & Water Conservation District, and received $1.75 million from Congress. In June 2002, Congress appropriated $5 million to the Municipality for wildfire mitigation through the United Stated Department of Interior Appropriations bill. Subsequently, an additional $4.1 million in 2003 and $2 million for 2004 have been appropriated to continue mitigation work.

In 1999, FEMA designated $400,000 of Project Impact funds to help Anchorage initiate a wildfire mitigation program through hazard fuel reduction and education. The Anchorage Fire Department contracted the Tazlina Hotshots, a Type I wildland firefighting crew, to remove dead trees from area parks and subdivisions. This crew cut dead trees north of Prospect Heights subdivision and along park trails in Anchorage and Eagle River including Forsythe Park, Ruth Arcand Park & Equestrian Center, Hilltop Ski Area, Huffman Park, and Spirit Park. A residential chipping program provided roadside brush removal for homeowners and Firewise packets were distributed throughout the community.

In September 2000, the Anchorage Soil & Water Conservation District (ASWCD) began development of a mitigation effort. Through partnership with the

Municipality of Anchorage and several other agencies, organizations, and businesses, the ASWCD initiated the Anchorage Wildfire mitigation program. The Municipality of Anchorage sought cooperation in this effort and program administration was adopted by the Anchorage Fire Department. Support from many Municipal departments, as well as state and federal agencies continues today as the Anchorage Wildfire program expands to all communities within the Municipality of Anchorage.

Funding for the Anchorage Wildfire program has been directed toward many mitigation projects encompassing education, planning, fuel reduction, and emergency preparedness:

- *Public education through television, radio, public displays, brochures*
- *Direct homeowner education with SCA Fire Education Corps*
- *Remove hazardous fuels on public and private lands*
- *Brush disposal at public wood lots and limited pick up service*
- *Train fire fighters at the Anchorage Fire Department and police officers at the Anchorage Police Department with wildfire suppression and response tactics*
- *Improve AFD suppression capabilities with brush trucks, portable pumps to draft water from streams, contract helicopter with State Forestry, and maintain mutual aid agreements with state and federal agencies*
- *Assess wildfire threat through risk mapping and fuel type modeling*
- *Draft community-based wildfire mitigation plans*
- *Support forest health through management and reforestation*

Education

- Anchorage Wildfire website at www.muni.org
- Firewise home evaluations
- Firewise Alaska booklets
- Dedicated TV news stories
- Radio and TV public service announcements
- Local Cable 10 wildfire programming
- Extended outreach media: java jackets, cinema slides, bus signs
- Local presentations to community groups
- Displays at local & regional events

Community Assessment

- Vegetation mapping
- Forest fire fuel inventory
- Fire behavior modeling
- Community-based wildfire assessments and action plans
- Land Use Code review and modification
- Monitor fuel loading & vegetation changes

Hazardous Fuels Mitigation

- Cost share tree removal program for homeowners
- Brush disposal program
- Vegetation treatments on public and private lands
- Develop and implement maintenance plan

Wildfire Operations

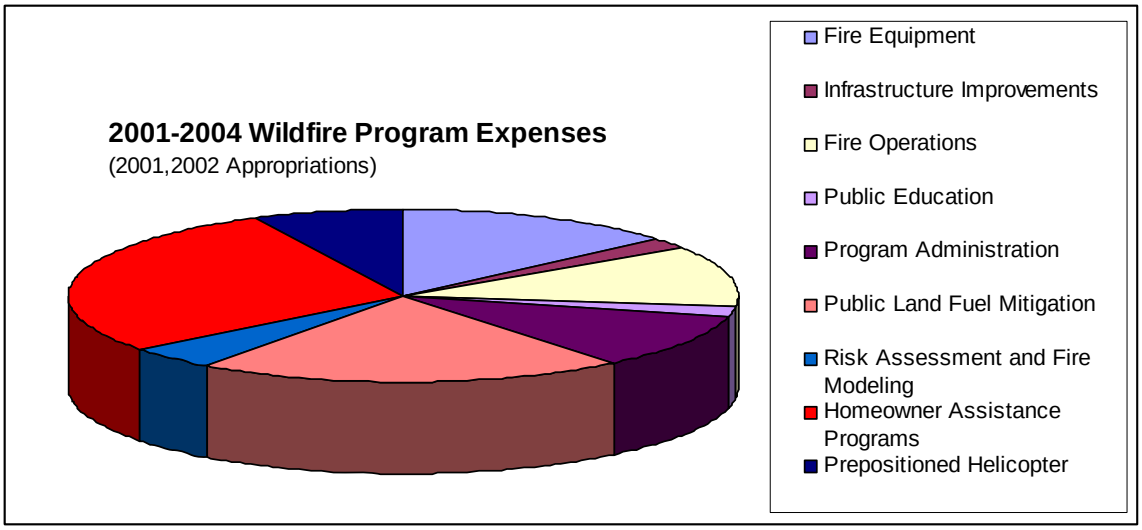
- Water drafting sites identified & improved
- Updated road network mapping & construction
- Interagency wildfire simulation exercises
- Wildfire behavior and response training for firefighters & police officers
- Upgrades to equipment and protective gear
- Evacuation planning
- Coordination with State Forestry & other mutual aid providers
- Post incident recovery plan

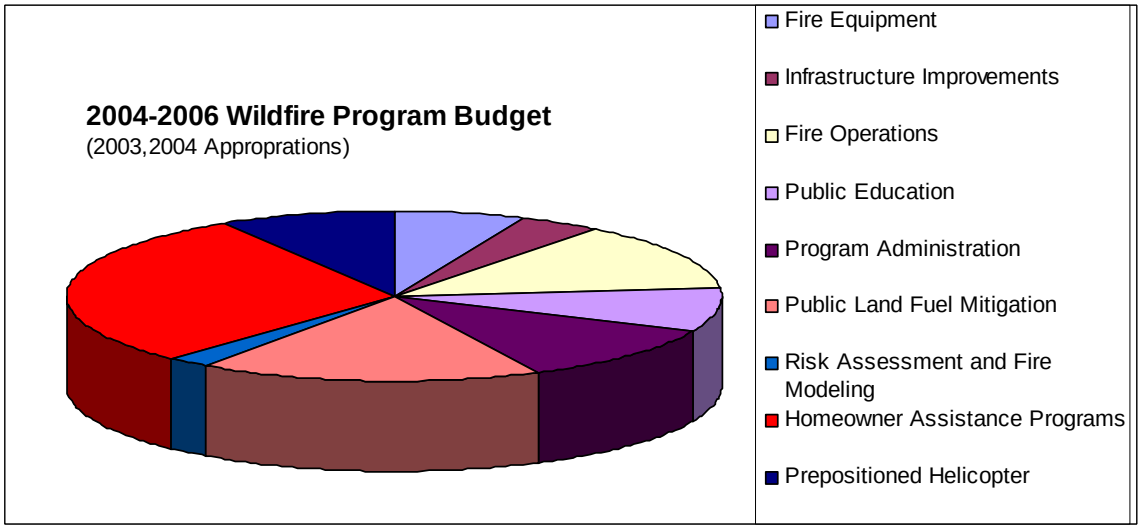
The combined 2001 and 2002 appropriations of $6.75 million funded the wildfire mitigation program from July 2001 through May 2004. The 2003 and 2004 appropriations will fund the program from June 2004 through December 2006. The majority of the funding received was spent on hazardous fuel reduction projects and homeowner assistance programs.

Anchorage has over 85,000 acres of land affected by the spruce bark beetle epidemic. Homeowner programs directly assist residents in creating defensible space around their property through removal and disposal of dead spruce.

The second focus of the funding has been on emergency response preparedness for both Anchorage area residents and the Anchorage Fire Department in coordination with the Alaska Division of Forestry. The Anchorage Fire Department believes this money is well spent if wildfire preparedness efforts result in no lives lost during a wildfire event, both of local residents and emergency personnel.

The Anchorage Fire Department is seeking an additional $5 million to continue this beneficial program through 2011.


2001-2004 Wildfire Program Expenses
(2001,2002 Appropriations)
Fire Equipment
Infrastructure Improvements
Fire Operations
Public Education
Program Administration
Public Land Fuel Mitigation
Risk Assessment and Fire Modeling
Homeowner Assistance Programs
Prepositioned Helicopter


2004-2006 Wildfire Program Budget
(2003,2004 Approprations)
Fire Equipment
Infrastructure Improvements
Fire Operations
Public Education
Program Administration
Public Land Fuel Mitigation
Risk Assessment and Fire Modeling
Homeowner Assistance Programs
Prepositioned Helicopter

Phase I: 2001

Initiate research & address primary mitigation and response

- Evaluate and assess Municipal infrastructure for emergency preparedness
- Develop fire operations plan
- Model fire behavior with local conditions
- Educate landowners about fire risk and defensible space
- Develop guidelines for reducing fuels in forested stands
- Continue hazard fuel reduction on public & private lands
- Initiate brush disposal system

Phase II: 2002-2006

Fuels Mitigation & Fire Operations

- Implement emergency preparedness plans for Municipal infrastructure
- Develop evacuation plan
- Establish monitoring program to evaluate and maintain low hazard fuel conditions for public and private lands
- Continue education to landowners
- Facilitate Firewise Communities in neighborhoods
- Continue hazard fuel reduction on public and private lands
- Monitor natural regeneration, plant trees where appropriate
- Develop long-term brush disposal program
- Develop an incident recovery plan

Phase III: 2007-2011
Mitigation and Maintenance

- Maintain sound emergency evacuation and operations plans for fire emergencies
- Continue education to landowners
- Maintain Firewise Communities
- Monitor and maintain low hazard fuel conditions on public and private lands
- Continue brush disposal program

A number of factors influence the wildfire danger presented to residents in the Municipality of Anchorage. AFD has considered these factors in its 10-year plan to mitigation the potential for a wildfire disaster. While the issue is complex, the fundamental problems are grounded in basic conditions at the local level.

Residential development amid combustible vegetation

Since people began establishing homesteads and neighborhoods throughout the Anchorage area, fire ignitions from human activity have affected the vegetation patterns and local resident safety. Building homes in these forest and grass types introduces a new fuel type: the structure itself. The density of homes for a given neighborhood contributes to the intensity and spread of wildfire. Consider the radiant heat emitted from a burning house and the burning embers carried aloft from construction materials being consumed by the fire. In addition to the structure, personal items and organic debris collected around the home are often the point source for a fire to attain sufficient heat to ignite the home. The causes of ignition by residential use of fire, careless ignitions from vagrants, and warming or cooking fires from homeless people are direct results of increasing population density of a community.

Forest stand structure and associated fire behavior

Mixed hardwood and conifer forests across the Municipality typify Alaska's boreal forest. In times of high fire danger conditions, the arrangement of standing and down forest fuels combined with the volatility of white spruce, black spruce, and *Calamagrostis* grass contribute to potentially extreme fire behavior. White spruce trees have persistent branches that contribute to ladder fuels. Black spruce trees have a very low moisture content that allows them to burn easily when the relative humidity is low and ambient temperature is high. Dry duff layers in the soil and cured *Calamagrostis* grass in the forest understory support rapid fire spread. In addition, the spruce bark beetle (*Dendroctonus rufipennis*) epidemic, causing thousands of spruce trees to die, contributes substantially to the fuel loading in Anchorage's forests. This leads to increased fire behavior through high fire intensity, rapid spread rates, and long flame lengths, all contributing to the difficulty of fire suppression.

Topographic variations common throughout areas of the Municipality increase fire spread rates. Where the Miller's Reach Fire of 1996 spread across mostly flat terrain and still burned over 400 structures across 37,000 acres, a wildfire in South Anchorage could spread even faster through the hilly residential areas. Steep canyons and diurnal winds strongly influence the fire's spread through radiant and convective ignitions along with spot fires.

Fire Suppression Capability

While AFD has substantially increased its training and response capability for wildfire, even the 1,500 homes of the South Fork of Eagle River may not all survive with assistance

from the South Fork Auxiliary Fire Department and AFD apparatus. Consider the expanse of the urban and suburban areas in the Anchorage Fire Service Area and AFDs repertoire of response apparatus. These 45 vehicles cannot all respond to one incident simultaneously while other emergencies may be occurring in the area. Furthermore, assessment of the number and types of calls answered by AFD and the local volunteer departments does not warrant significant increases in response apparatus. However, judicial use of funds to strategically position water tenders, contract a helicopter for bucket drops, and support brush rig surveillance capability are critical tactics for initial attack of a reported fire. This type of effort has proven effective in containing numerous brush fires within minutes of dispatch.

In a wildfire event, mutual aid resources to help the Anchorage Fire Department may take an hour or more to arrive on site. Fire engines and the air tanker from the Division of Forestry must travel to Anchorage from Palmer and other locations outside of the Municipality. If conditions support wildfire in the Municipality, it is possible that many of these resources will be committed to dispatch calls for their respective local areas, as well. Considering the fire potential in the Mat Su Borough and across the Kenai Peninsula Borough, local, state, and federal suppression resources may be stretched very thin.

Due to the existing infrastructure of the Municipal water supply, hydrants are extremely limited to non-existent on the south Anchorage Hillside, Eagle River Valley, South Fork and other sites around the MOA. AFD has updated its water resource index to delineate useful water drafting sites throughout the Municipality; many of these sites have been improved to support rapid re-supply of fire engines.
Many neighborhoods in the MOA have limited ingress and egress routes for suppression apparatus and residential evacuation. Oftentimes, only one access route is available. Consider Eklutna Valley, upper Peter’s Creek, Eagle River Road, Hiland Road, Stuckagain Heights, Bear Valley, Potter Valley, Indian, and Girdwood.

To allocate proper resources to mitigating wildfire risk through hazard fuel reduction, road access improvements, supplying water for fire suppression, and fire suppression response, a concerted effort is being placed on planning. By using satellite imagery, geographic information systems and a recognized fire behavior model, priorities can be assigned to mitigation and preparedness activities.

Wildfire Exposure Assessment

Through a concerted effort to map vegetation, identify fire ignition potential, and evaluate fire response, the MOA and Geographic Resource Solutions have developed a comprehensive modeling program to evaluate fire danger throughout the Municipality. Specific variables include fire behavior per fuel types, slope, and aspect; proximity of fire stations and available suppression apparatus, water resources, road access, and population density. Variables are weighted to reflect the potential for fire to ignite, spread, and be suppressed. Community values can then be protected by modifying specific risks and hazards. Fuel treatment projects, road network modifications, and improving water drafting sites are all tactics to reduce the wildfire exposure of a neighborhood. In 2003, Fire Station #14 was built at the corner of Tudor and Campbell Airstrip Road. While this addition to AFDs fire service area was funded by bonds outside of wildfire appropriations, AFD significantly increased its response capability to surrounding neighborhoods including Stuckagain Heights.

Land Use Codes

Municipal land use codes have influenced the characteristics that make MOA neighborhoods at risk for wildfire. The land use codes or in some areas of the MOA, the lack of land use codes have allowed for residential development that include: narrow roads, poor road connections with subdivision developments with only one means of access and egress, no house numbers, roads built too steep to allow for fire apparatus access and driveways and bridges built to narrow or without sufficient load capacity to support a fire truck or ambulance. In addition, MOA construction standards historically have not addressed structural fire ignition construction, allowing for homes to be built with wood shake roofs and structural features susceptible to ignition during a fire. In 2001, AFD facilitated a working group that developed a local land use standard based on the Uniform Wildland Urban Interface Land Use Code. This standard will be incorporated into the 2004 revision of the MOA's land use code (Title 21) as a wildfire urban interface overlay district. These codes will apply to new construction in interface areas of the MOA.

Fire Behavior Analysis

Fire experts from State Forestry and the National Park Service supported the scientific analysis of the wildfire exposure mapping and modeling project. By using the resident knowledge and experience of these professionals, AFD has gained the technological tools to plan fuel treatment projects, fire suppression tactics, training needs, and wildfire simulation exercises. Additionally, this assessment drives the educational effort to inform

Anchorage area residents about wildfire behavior, protecting lives and structures, and how to evacuate or shelter in place during a wildfire event.

Fire Science Team

Coordinated through AFD, this multi-agency technical advisory group meets quarterly to assess the progress of the wildfire mitigation efforts including the wildfire exposure modeling and mapping project. Members address prioritization of fuel treatment projects, forest management impacts and operational objectives. Specifically, the team discusses potential fire behavior and site prescription options for various forest types that occur across the Municipality. Strategies for reducing fire spread include construction of shaded fuel breaks, removal of ladder fuels, and fuel treatments in the home ignition zone. Currently, the team is assigned with developing a long term monitoring plan for fuel loads and a respective maintenance plan for stands that have already been treated to support fire suppression while accounting for regeneration and forest health.

These professionals represent the fields of fire ecology, structural and wildland fire operations, fire behavior, social and cultural considerations, forest management, wildlife habitat, and geographic information technology. Among the local, state, and federal agencies that form the Fire Science Team, technology transfer often occurs between the Anchorage Wildfire effort and statewide project leaders addressing similar or related issues throughout Alaska.

University of Alaska Fairbanks Cooperative Research Project

Through a cooperative effort between AFD, Division of Forestry, and the National Park Service, graduate student Daniel Cheyette developed custom fuel models for use in the fire behavior program Farsite. Work was based on field assessments of fuel loads and forest structure with inventory assistance from the PNW Anchorage Forestry Sciences Laboratory. Utilizing his research, custom fuel models for Anchorage area forests were developed in partnership with Geographic Resource Solutions to model wildfire exposure.

MOA Management and Information Systems technical support

Technical assistance provided by MOA MISD allows for the integration of existing Municipal data resources and mapping layers into the wildfire exposure model and map. Additionally, these staff members update the Anchorage Wildfire website with mapping products and water resource information.

Neighborhood Wildfire Assessments

Evaluations are being made for each neighborhood most likely to be impacted by wildfire. These community wildfire assessments reflect the results of the risk model and account for residential values specific to that neighborhood. Safety zones, evacuation routes, and water resources are identified in each assessment. AFD Foresters summarize forest characteristics and draft plans for reducing forest fuels and maintaining a Firewise landscape. These *"works in progress"* are provided to residents for review, modification, and supplemented with special neighborhood considerations.

AFD Foresters coordinate fuel reduction projects in neighborhoods throughout the Municipality. These projects are designed based on potential fire behavior from fuel type and topographical influences, homeowner participation and interest, and neighborhood benefit from wildfire spread reduction.

Anchorage: a community at risk

In 2001, Anchorage was declared a community at risk for wildfire by the US Forest Service. Throughout the Municipality, residential and rural neighborhoods exist in forested stands that have been affected by the spruce bark beetle. While the epidemic spreads across 85,000 acres in the MOA alone, the resulting dead trees from beetle attacks contribute to forest fuel accumulations that create high risk for wildfire in residential backyards. Although the epidemic is waning, the dead and dying spruce trees combined with the stand structure of our boreal forests increase the threat of wildfire in our community. White spruce, black spruce, and *Calamagrostis* grass carry fire and intensify its behavior.

Outside of the spruce bark beetle, our community could still experience a wildfire due to the composition and structure of vegetation in suburban and rural forests. Through human-caused ignitions, brush fires can occur in almost all of our neighborhoods. Whether a fire travels through the dry grasses in spring or through the black spruce in mid-summer, homes are at risk of ignition if the fire conditions are met and a home's defensible space is not adequately prepared.

Managing for fire and forest health

AFD uses science to make management decisions for fuel treatment projects. AFD Foresters work cooperatively with State Forestry fire behavior experts to assign prescriptions to forested areas. In addition, mitigation strategies focus on the home ignition zone for residential areas. This 100-200 foot radius around a structure has been proven time and again to be the most influential zone determining a home's ignition potential. Case studies from across America, Canada, and Australia show repeated accounts of homes burning to the ground while trees and surrounding vegetation remain green. Furthermore, documented research conducted by Jack Cohen of the Missoula Fire Sciences Laboratory substantiates efforts to reduce home ignitions through extending vegetation treatment and landscape management to the 100 foot radius. Research papers are available for public view at www.firelab.org.

Sites are recommended for treatment by reconnaissance of neighborhoods, reviewing maps, and through discussions between homeowners and AFD personnel. AFD Foresters assign a site prescription based on the forest stand type, land owner priorities and community values. These treatments are reviewed and modified by wildland fire experts from Division of Forestry, as needed.

Typically, all spruce trees killed by the spruce bark beetle are treated. This includes both standing and down trees. Treatment means that the "fuel" is reduced by felling and limbing a tree. The log is bucked into firewood length pieces and stacked on site. Slash from the limbs and top is stacked for burning or chipping, depending on the site and cost.

Wood utilization from the logs is not sufficient to economically extract the material from the woods and deliver it to a manufacturing facility. The extent of rot from fungus, loss of fiber from carpenter ants, and shake from wind usually renders the wood unusable for commercial applications. Furthermore, while some contractors have effective means to extract these logs without scarring the land, it is not within AFDs mandate to fund wood utilization since this effort would not yield any monetary return to the program. Log extraction has been tried in the initial stages of the wildfire program and the result was an expensive logging project that forced the contractor to use creative means to use the wood since most of it was too rotten to mill or use as house logs.

Logs are cut into firewood lengths primarily to dry out the cambium layer under the bark. This degrades habitat for further bark beetle use by several species. Firewood is available to the public if the site is on public land and access does not impact local residential properties. Only non-motorized firewood retrieval is permitted.

Slash pile burning is practiced on most sites. This practice is more cost effective than chipping. Furthermore, once the slash is piled after tree work, most local contractors cannot feasible chip the material because piles compact quickly and are difficult to pull apart. Additionally, the dry, dead wood quickly wears the chipping knives thus requiring frequent replacement and expense. Burning by State Forestry crews and AFD Brush Rig crews provides a safe and effective means to reduce the volume of combustible material in forested areas. It also reminds Alaskans that fire can be used safely under appropriate conditions. The residual burned area can lead to increased growth of *Calamagrostis* grass, which contributes to fire spread in spring, but it also provides a seed bed for birch and spruce regeneration. Fire prevention is an indirect benefit of supporting crews working in area forests by deterring youth and vagrants from littering and building recreational fires.

Forest stands treated to reduce the spread of fire are often revitalized. The process of removing dead and dying trees and thinning live green trees creates openings in the forest canopy. Residual healthy trees have access to more light, water, and nutrients. Openings also allow for spruce and birch regeneration, thus contributing to healthy green forests. The resulting variation in stand structure leads to more wildlife and bird habitat.

Fuel treatment project highlights

Crews working on fuel reduction projects include the AFD Brush Rigs, Division of Forestry Pioneer Peak Crew and the Tazlina Interagency Hotshot Crew. These crews have a primary responsibility to respond to wildland fires in the Municipality, Southcentral Alaska, and the State, respectively. Additionally, the Pioneer Peak Crew and the Tazlina IHC both respond to wildfires in the Lower 48 and Canada. The Municipality receives greater wildfire suppression capability with these two additional crews on staff here in the summers. Their wildland expertise supports and complements the jurisdictional responsibility of the Anchorage Fire Department.

Some fuel treatment projects and additional community assistance programs are delivered through private contractors. Work assignments depend on the nature of the project. As neighborhood projects become more typical of AFDs fuel treatment activities, more projects will be placed on the public bid list.

Over the past several years, the nature of projects spans from extensive shaded fuel breaks such as the Hillside Fuel Break, adjacent to Prospect Heights subdivision, to backyard projects such as a parcel on Birdsong (Hiland Road area) where extensive fuels exist outside of the home ignition zone, but greatly influence fire behavior affecting the entire neighborhood.

In 2003, residents from the Sahalee subdivision along Abbott Road approached AFD Foresters regarding their concern over the black spruce stand within Far North Bicentennial Park directly adjacent to their homes. AFD evaluated the site and assigned the Tazlina Hotshots to task of thinning black spruce trees and treating the dead and dying white spruce. Mature, healthy trees were pruned and allowed greater growth potential from the surrounding treatment. Later that fall, the Pioneer Peak Crew returned to the site to burn the residual slash piles. Homeowners used the firewood created from the project. The result of this project is an effective fuel break that offers improved suppression capability in the event that a fire is spreading through the frequently used forests of the park. Frequent ignitions occur around Service High School and could easily spread to this neighborhood. AFD Foresters had direct contact with homeowners to discuss Firewise principles and encourage continued participation in the program.

That same year, AFD canvassed homeowners along DeArmoun Road to initiate a fuel reduction project between Old Rabbit Creek Park and adjacent private parcels. The combined effect of the canyon topography and volume of fuels on the slopes would accelerate the spread and intensity of a fire. Burning embers flying ahead of the flames would likely support structural ignitions due to their shear volume and existing condition of fuels surrounding these homes. In total, 26 homeowners participated in this project that was completed by the Pioneer Peak Crew. All slash was burned that fall. While work still exists in this drainage, significant progress was made in this initial phase.

Surrounding the original 50-acre homestead of Anchorage residents Grant & Georgia Forsythe, hundreds of dead, bark beetle-killed spruce trees litter their beautiful corner of the hillside. Although this parcel was divided by choice of the Forsythe's and 26 acres was donated to the Municipality and designated as Forsythe Park, the family maintains their interest in sustaining the natural setting of the park and their land. AFD Foresters have worked with this family to support fuel treatment projects in the park and surrounding parcels. A pilot project to demonstrate small-scale logging equipment was demonstrated on the Forsythe property in 2001. Additionally, the Forsythe's hired a contractor to remove dead trees surrounding the home, outside of the cost share tree removal program. These large parcels around the Municipality are examples of the next phase of mitigation projects because their respective fuel loads could influence the ignition potential of adjacent homes. A list of projects completed from 2001 to 2003 and plans for 2004 is available on the AFD wildfire website at www.muni.org/fire1/wildfire.cfm.

AFD offers a host of programs to help residents learn about wildfire risks, prepare for a wildfire event, and mitigate the hazard of fire. These programs have shifted in focus over the past three years to reflect the participation and education level of the public. While subscribing to the Firewise message greatly benefits homeowners, behavioral change of this nature takes time and adjustment at the community scale. The long-term intent of AFD is to incorporate these programs into self sustaining, Municipal operations. Currently, federal appropriations still fund the majority of these programs while Municipal and State budgets account for the changing economic structure in Alaska.

Wood & brush disposal and utilization

In 1999, AFD offered free brush pick up with Project Impact funds from FEMA. This initial wildfire mitigation program motivated many homeowners to prepare their Firewise defensible space. To encourage homeowners to be more active in their responsibility to prepare for wildfire, in 2001 AFD partnered with the Anchorage Soil & Water Conservation District to open wood lots in Eagle River, Girdwood, and Anchorage. Since that time, the brush pick up program has decreased in its scope. Starting in 2004, homeowners will be charged a nominal $5 disposal fee for depositing wood material at the wood lots. To ease the transition to a service charge, 4 free disposal coupons were delivered to each home through the Val-Pak Coupons distributed in April and May 2004.

AFD has partnered with other Municipal and local agencies to develop a long-term operational plan for disposal or utilization of wood waste resulting from fuel reduction projects. While the prevention of fire ignition and protection from its impact is the primary intent of the Anchorage Wildfire program, it would be more appropriate for other entities to address wood waste on the Municipal scale. Currently, several concepts for landscaping and composting are under experiment. Additionally, incineration is proposed to be tested in Fall 2004 in cooperation with MOA Solid Waste Services.

Firewise home evaluations

Through the Student Conservation Corps, contracted firefighting crews, and AFD staff, homeowners throughout the Municipality have been provided with free Firewise home evaluations. Because wildfire risk in local interface areas involves much more than trees, on-site visits offers homeowners the benefit of a science-based assessment with a fire professional to discuss all aspects of preventing home ignitions and how to survive a wildfire. These visits are critical for homeowners to understand their own capability to prevent a home ignition. Care and maintenance of a home's defensible space and home ignition zone can only be implemented by the homeowner; AFD offers technical and financial assistance upon request. Preparing to survive a wildfire must be a family discussion that includes all household members and their respective abilities or disabilities. This aspect of becoming Firewise that requires behavioral change and, consequently, it requires education to establish preparedness before a conflagration wildfire occurs. Where tree work is critical to reduce fire spread to the home, AFD offers the cost share tree removal program.

Cost share tree removal program

As homeowners became more interested in preparing their Firewise landscapes, AFD established the cost share tree removal program. After receiving an on-site assessment by one of AFDs Foresters, the homeowner is given a written site prescription describing recommended tree work and other actions intended to reduce the potential of a home ignition from wildfire. Homeowners then hire a local tree service company to conduct the prescribed tree work. Companies must provide AFD with certification of insurance coverage and workman's compensation. Once the homeowner has paid the invoice for tree work and signed the agreement to maintain their Firewise landscape, AFD issues a check back to the homeowner for 70% of the cost.

Neighborhood fuel reduction projects

AFD Foresters communicate with homeowners through community councils, homeowner associations, and other contacts. Residents can call or email for information, as well. Oftentimes these relationships initiate projects that benefit entire neighborhoods. AFD Foresters have the latitude to combine programs to maximize the participation of the residents. This type of relationship is wide spread throughout the Municipality and promotes trust through professionalism and expertise in wildfire prevention, forestry, and emergency preparedness. Neighborhood fuel reduction projects incorporate the cost share tree removal program for the first 100 feet around the home, the home ignition zone, and AFD funded firefighting crews to treat forested areas between homes or subdivisions. AFD Brush Rigs and water tenders often conduct burning where chipping by a private contractor might not be physically feasible. AFD is currently exploring options to contract burning operations and extended fuel treatment projects to private companies with sufficient qualifications for these respective activities, as well. Considerations for site impacts are prioritized by neighborhood.

Firewise Communities/USA

Now entering its fourth year, the Anchorage Wildfire program has set the foundation for advancing homeowner accountability to a level needed for self-sustaining Firewise Communities. This national program recognizes partnership efforts among residents and local agencies to formulate wildfire preparedness strategies specific to a neighborhood. AFD Foresters coordinate comprehensive wildfire assessments that account for fuel reduction projects around homes, evacuation routing, AFD response capability, water resources, and safety zones for residents. As the program matures, it is imperative for neighborhoods to creatively determine cost effective methods to accomplish these objectives beyond the funding allowance of the current budget. AFD continues to facilitate and expand these cooperative projects to promote sustainability of the Anchorage Wildfire program through community support.

Alternative Water Supplies

Most of the MOA wildland urban interface areas have limited public water (hydrant) service needed for effective wildland fire suppression. AFD has sought to improve access to alternative water sources, known as water drafting sites. These are sites where water is drafted out of a lake or stream directly by a fire truck or portable pump. To accomplish this AFD has improved physical access to the sites and has created a water resource map book also accessible to the public on the wildfire website. Additionally, AFD is working with the Alaska Department of Natural Resources and Fish and Game to permit permanent standpipes at key water access sites in Anchorage, Eagle River and Girdwood, to facilitate faster water flow. Reflective water drafting signs are also being installed in spring of 2004 at each site and sites were pump field tested by firefighters in 2003.

Wildfire Exercise and Interagency Communication

AFD, Alaska Division of Forestry, the MOA Emergency Operations Center and the Anchorage Police Department have conducted yearly spring wildfire simulation exercises. This annual exercise serves to practice interagency communications, the public notification system, evacuation and fire suppression field operations. In 2004, the wildfire scenario will occur June 8th in Eagle River with a simulated wildfire occurring down Eagle River Road. In 2003, the exercise involved a fire spreading from BLM Campbell tract lands and involved the evacuation of Stuckagain Heights residents. In 2002, the exercise involved a fire on the Anchorage Hillside spreading through the lower and upper Hillside neighborhoods. All exercises provide practical training for response personnel and heighten the awareness level of residents through media coverage of the event.

Wildfire Equipment and Personal Protective Gear

In recent years, the State of Alaska, due to budget restraints has slowly discontinued it's wildfire equipment loan program to Alaskan fire departments. The Anchorage wildfire mitigation program has worked to provide adequate strategically placed wildfire equipment in the Anchorage Fire Service area and the areas served by the three volunteer departments of Girdwood, Chugiak and Southfork.

Wildfire Evacuation Planning

In Fall of 2002, AFD and the Anchorage Police Department partnered to facilitate a working planning group comprised of municipal departments and Alaska Division of Forestry to address evacuation issues in the MOA. The resulting planning report addressed components and interagency roles and responsibilities and legislative intent required to facilitate an effective evacuation in the MOA. This document will become the Evacuation Annex of the updated Anchorage Comprehensive Emergency Management Plan. Traffic count estimations of evacuation timelines were conducted on key areas of the MOA based on census data supplied to the Traffic Department. Existing developed roads and undeveloped right of ways across the MOA were analyzed by the committee to determine a number of undeveloped road improvements which if developed would provide improved

access and egress in the event of an emergency. The committee in partnership with the MOA Legal Department developed an Evacuation Refusal to Evacuate Form to address the legal liability of those residents who will not be leaving their residence during an evacuation. In addition, a system to flag houses evacuated was created. In spring 2003, Statefarm Insurance Agency partnered with AFD to produce the creation of an Evacuation PSA with airtime and an evacuation brochure.

Advanced Wildfire Training and Type 3 Incident Management Team

AFD has increased improved its capacity to respond to wildfires, by increasing the standard and level of training provided to its fireline personnel. All AFD Captains are being trained in intermediate fire behavior and crew boss/engine boss standard. Senior Captains are being trained to a Strike Team/Task Force Leader qualification. Battalion Chiefs are working towards being trained to a Division Supervisor and Type 3 Incident Commander qualification. In 2004, in response to the recent mandates by FEMA, AFD is actively planning the formation of an AFD Type 3 Incident Management Team. Formation and training of this team will serve Anchorage residents by creating a cadre of local incident management qualified personnel.

Improved Emergency Public Communications and Information

AFD, through the leadership of the fire department Public Information Officer, has increased the capacity, training and availability of its emergency Public Information Officers. The MOA now has a cadre of Incident Management Team Type 3 and Type 2 trained Public Information Officers representing a number of municipal departments. These individuals have been trained to accurately disseminate wildfire information to the public through the media and at evacuation checkpoints. The fire department has also created a live video broadcast link between the emergency operations center and local media, to broadcast accurate tickertape and screen information regarding fire and evacuation information to the public.

Emergency Operations Center Communications Upgrades

Wildfire funding assisted the EOC in obtaining emergency management software (WEBEOC) and research a 311 emergency public callcenter program to help the EOC assist the public more efficiently during a natural disaster. In addition, wildfire money has been set aside to partner with funding from the Anchorage Police Department to assist in the purchase of reverse 911 system for the MOA. This reverse 911 system would provide early warning to residents of the need to evacuate. A dispatcher in the EOC could select an area of the MOA, type in a warning, and all residents of the selected area would receive a phone call message. Additional radios were also purchased to allow for interface communications between the MOA 800mhz trunk radio system and the State of Alaska VHF radio system.

Improved Wildfire Safety Training for Police Officers

The Anchorage Police Department will be the key municipal department charged with evacuating the public during a wildfire. AFD provides annually to the police department,

comprehensive wildfire training. This includes wildfire behavior safety training, basic personal protective gear, law enforcement lessons learned in evacuation from the Miller's Reach fires and a review of evacuation legislation and procedures.

Operations Mapping: Maps and Mobile GIS Applications

In 2003, the wildfire mitigation program supplied all municipal fire apparatus with operations sized aerial map sets of Eagle River, Anchorage and Girdwood. These maps show the trail system, water drafting sites and GPS coordinates to assist emergency responders responding to brush fires. The wildfire program partnered with Geographic Resource Solutions to create a mobile pocket PC mapping program. This allows firefighters to record homes evacuated or triaged during a fire or fire GPS coordinates into a pocket PC GIS mapping system. This unit can then be downloaded at the incident command center to create an instant map of the area which than then be transmitted to the EOC for their long-term incident planning efforts. Future wireless upgrades to the cellphone communications coverage in southcentral Alaska, will allow for this information to one day be transmitted directly live-time from the fire site to the EOC over a cellphone connection.

If or *when* a wildfire occurs, considerable damage to life, property, and natural resources may result. Over the entire Municipality, the Anchorage Wildfire Partnership is working to educate the public about the risk of fire. By instilling Firewise behavior in homeowners, community leaders, developers and planners, the risk of losing life and property to wildfire can be reduced. Consequently, Firewise principles also frequently overlap with the prevention of structural fires igniting inside the home.

Door to Door Homeowner Contact (canvassing the neighborhoods)

During the first wildfire simulation exercise in 2001, fire professionals from AFD, Division of Forestry, and other partnering agencies visited homes and distributed Firewise Alaska booklets to over 1,000 homes on the Anchorage Hillside.

In 2002 and 2003, 19 interns from the nationally based Student Conservation Association (SCA) Fire Education Corps canvassed 4,578 home throughout Eagle River and Anchorage. Additionally, interns provided 435 Firewise evaluations throughout all communities in the Municipality. These college students and graduates volunteered their summers to educate homeowners on tactics to reduce the potential for home ignitions from wildfire.

In 2003, firefighters from contracted crews communicated with individual homeowners concerning defensible space and recommended vegetation treatments around the home.

AFD Foresters continue to canvass homes in high-risk neighborhoods to coordinate fuel treatment projects between parcels. This personal contact produces positive relationships between AFD and homeowners throughout the Municipality. More importantly, it allows another avenue to provide on-site, science-based information to point out specific ways that residents can improve their home's chances of surviving a wildfire.

Community meetings

AFD Foresters and Firefighters regularly attend meetings with community councils and homeowner associations. Through these contacts, other neighborhood groups request AFD to attend their functions and present wildfire preparedness information.

Creative awareness messages

The Anchorage Wildfire Partnership developed a myriad of strategies to deliver the Firewise message. Signs on People Mover buses, java jackets provided to local coffee stands, and cinema slides shown at area theaters have been used to increase wildfire awareness. Additionally, the Anchorage Soil & Water Conservation District provided information to area pilots regarding aerial wildfire operations and airspace restrictions.

Wildfire website

AFD maintains the wildfire website at www.muni.org/fire1/wildfire.cfm. This site is updated regularly and empowers homeowners to prepare their home for wildfire, evacuate & shelter in place safely, construct low-cost water tanks, schedule Firewise evaluations, and how to obtain technical and financial assistance to plan a fuel reduction project. Additionally, the site describes annual mitigation project plans, wildfire program updates, and links to other communities and national programs, among many other resources.

Municipal cable channel 10

Through AFDs Video Center, spring and summer programs focus on educational wildfire productions such as *Northland Wildfire: Lessons Learned* along with Firewise videos and wildfire documentaries. Over 100,000 viewers have access to these programs.

Local media

Wildfire program updates are provided to the public regularly through radio and television news coverage. These same stations often air informational bytes with wildfire preparedness tips through coordinating frequent interviews with AFD staff.

Publications

Firewise Alaska booklets, defensible space guides, evacuation & shelter-in-place handouts, and other brochures are distributed to homeowners at community meetings, garden shows, greenhouses, and local summer events.

Annual newspaper inserts provide contact information to AFDs Wildfire Mitigation Office and educate homeowners on specific wildfire mitigation tactics. Available programs and operations are also described in this publication. In 2004, AFD partnered with Mat Su Borough to release a joint newspaper insert for residents throughout both the MOA and Mat Su.

Public service announcements

Wildfire messages are displayed on local radio and television channels. Through production capabilities within the AFD Video Center and assistance from local contractors, carefully crafted audio and imagery illustrates the importance of preparedness as seen in the 1999 production of *Northland Wildfires: Lessons Learned*.

Special promotional mailings through local distribution avenues provide special notices to homeowners and contractors. In 2004, AFD delivered program reminders through the Val-Pak Alaska coupon packages.

Considering the financial support that the Municipality of Anchorage has received to date, over $12,000,000 has made significant impacts in wildfire preparedness of area residents and emergency responders. Through modeling wildfire behavior, scenarios depict hundreds of homes lost when 4,000 acres of the south Anchorage Hillside burn. Property damage alone exceeds $351 million. This cost does not account for fire suppression, infrastructure damage, or reconstruction for homeowners. Neither does it account for the intrinsic value of a home as a foundation for local families nor the aesthetic value of the MOA which adds the economic vitality of the tourism industry.

Fire Suppression

In the event of a catastrophic fire burning across Anchorage's suburban zones, AFD and regional mutual aid resources would be quickly overcome by the suppression effort and the number of people impacted. AFD expects to require the assistance of a national Type I Incident Management Team to manage the situation. In this case, AFD and the mutual aid responders would provide support to the team. Fires rated to a Type I Incident level, currently can expend up to $1 million per day in fire management costs.

Recovery for homeowners

While the current value of a home is assessed for Municipal property tax and home insurance protects the owner against complete financial loss, the cost of reconstruction greatly outweighs this assessment. In 2004, the local building construction climate is high, demonstrated by significantly higher increases in new construction than past years. Many homeowners have insurance for replacement value based on lower cost estimates. Displaced homeowners from the recent California fires experienced this similar problem when planning reconstruction of their homes. Displaced families may be forced to move outside of the MOA during the recovery phase, depending upon the availability of rental stock, causing them emotional hardship and incurring a financial loss the MOA local economy. Related problems may also affect communities in the Mat Su Borough regarding housing and social system impacts.

Economic loss for the Municipality

After a conflagration wildfire, the tourism industry that Anchorage and area communities such as Girdwood depend on for economic stability would likely be disrupted. Impacts of the fire, reported on the global news network would be significant. The beautiful landscapes across the region would no longer attract visitors from the lower 48 and other nations. This initial barrier may inflict economic loss to other regions of Alaska because many visitors begin their vacation in Anchorage.

Critical Public Infrastructure

Municipal and State roads, water systems, electric and gas lines, and other essential functions may be severely disrupted in a wildfire event. Replacement of this infrastructure

would be costly and need to occur prior to the fall and winter season for adequate community recovery.