



Proposed Climate Action Plan for the Municipality of Anchorage

**Prepared by the Climate Change Action Team (C-CAT)
at the University of Alaska Anchorage**

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Members of C-CAT







Anchorage, Alaska



Tatabánya, Hungary

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The Turul Bird welcomes visitors to Tatabanya, Hungary.

PROJECT BACKGROUND

In the summer of 2007, University of Alaska, Anchorage (UAA) Political Science Professors Mara Kimmel and Kimberly Pace attended a faculty summer intensive workshop on the topic of Climate Change & Sustainability. Specific attention was given to exploring ways in which the topic of climate change could be taught across the curriculum, whether it was in English, Math, Political Science, History, Art or Engineering, etc. After this weeklong UAA workshop, Professors Kimmel and Pace developed a project that created a faculty-student research team to identify and assess climate action plans from two communities in Europe to use as a model for the Municipality of Anchorage.¹

Professors Kimmel and Pace engaged six highly motivated and knowledgeable students who together represent a true cross-section of UAA students in terms of disciplines of study. Among the six students, several majors are represented including Economics, International Studies, Philosophy, Political Science, and Natural Sciences.

This past summer, the team initiated a series of meetings with local officials and community members working on climate change policy in Anchorage. At the end of July, all six students and Professor Kimmel traveled to Tatabanya, Hungary and Tromsø, Norway (Anchorage's sister city) to research local community-based policy responses to climate change. The research team toured water treatment plants, reviewed waste management and public transit systems, and interviewed top governmental officials and private individuals and organizations in both communities.²

Upon returning to Alaska the real work ensued. With regular consultations and input from Municipality officials and other experts in the field of climate change in Alaska, the students set about drafting a Climate Action Plan for our community. The plan focuses on six substantive areas: Outreach and Education, Waste Management, Transportation, Energy Efficiency, Energy Production, and City Planning. Each area is discussed in great detail in subsequent sections of this document.

One thing that has come out of this process is gaining an appreciation of the profound interest and determination that our young people have when it comes to these topics. It is after all, their future we are talking about and who better to learn from? Listen to their voices and hear what they are saying.

1 Funding for this project generously provided by The Chancellor's Fund Award for Research, Scholarship and Creative Activities, the Center for Community Engagement & Learning at the University of Alaska Anchorage, the Alaska International Education Foundation, the Union of Students at UAA (USUAA), UAA Undergraduate Research in the Community Grant, the Alaska Conservation Foundation, Deborah Williams, BP, the Department of Political Science and the Women's Studies Department at the University of Alaska Anchorage, EPSCoR and private donations.

2 The research team consulted frequently with Mr. Randy Virgin, Sustainability Director from the Municipality of Anchorage. In addition, students met with Dr. Francis Wiese, Science Director for the North Pacific Research Board, Kate Troll, Executive Director, Alaska Conservation Alliance, and Greenstar. C-CAT also wishes to thank Kris Keays-Gant in the College of Arts & Science at UAA, Dr. Barbara Botos, Strategic Manager, Municipality of Tatabanya, and Svein Erik Setermo, Managing Director, Visit Tromsø for making this trip possible.

EXECUTIVE SUMMARY

Municipal governments around the world are increasingly recognizing the critical role they play in global efforts to mitigate climate change.³ With one half of the world's population living in urban communities, a significant portion of human activity that is responsible for contributions to climate change occur in our cities.⁴ As half of the population of Alaska resides in Anchorage, our community likewise plays a pivotal role in contributing to climate change in our state.

The Municipality of Anchorage is currently engaged in a variety of projects and strategies designed to respond to challenges posed by climate change and to offset our contributions to this phenomenon. These range from improving our recycling program to working with the landfill to capture methane gases for fuel to promoting “green” buildings by easing permit requirements and timeframes for willing contractors and business owners. The community lacks, however, an overall plan for how the most populous city in the state respond to and mitigate climate change. In addition, and very importantly, the Municipality has yet to determine its own carbon emission levels. The lack of baseline carbon related information is highly problematic in that we lack data from which to create meaningful mitigation policies.

Recognizing the benefits of creating an overarching policy for our community's response to climate change, the UAA student research team, spent almost one year gathering information about what other communities are doing on climate change, and then creating a plan for the Municipality of Anchorage.

The plan focuses on six key areas of concern:

1. Energy Production and Sources
2. Energy Efficiency
3. City Planning
4. Transportation
5. Waste Management
6. Education and Outreach

With each of these areas, the following plan identifies key terms involved with each area of concern, any goals that policies related to the topic should seek to accomplish, current actions undertaken by Municipal officials or local community groups, and short, mid and long term action items

³ Betsill, Michele M., “Mitigating Climate Change in US Cities: Opportunities and Obstacles,” in *Local Environment*, Vol. 6, No. 4, 393-406, at 394 (2001).

⁴ Id.

associated with the areas of concern. The hope is to provide policy makers with enough information and ideas to inform creation and adoption of a municipal Climate Action Plan that can guide the Municipality of Anchorage in the years to come. However, the first step down this road must begin by ensuring we have all of the information needed to create meaningful public policy, which requires that we dedicate resources to understanding our own “carbon footprint”. Only then can we undertake the proper steps to ensure the security of our community’s future.

INTRODUCTION

A preponderance of scientific evidence demonstrates that carbon dioxide (CO₂) and other greenhouse gases released into the earth’s atmosphere have a significant impact on the Earth’s climate. From a human community standpoint, it has been argued that climate change is one of the most serious challenges of our lifetime.

In May of 2007, the Intergovernmental Panel on Climate Change released a report urging reductions of greenhouse gas emissions to avoid “serious or catastrophic” increases in global mean temperatures.⁵ Alaska has been described as “ground zero” for global warming because our high latitude means increased vulnerability for northern communities dependent on environmental stability in sea-ice, in wildlife populations, in stable fisheries and sound ecosystems such as forest and tundra types.⁶

The State of Alaska has begun responding to climate change. For example, the State Legislature created the Alaska Climate Change Impact Mitigation Program (ACCIMP) to assist Alaskan communities threatened by climate change-related impacts such as erosion, flooding, storm surge, and thawing permafrost.⁷ Similarly, Governor Palin created the Climate Change Sub-Cabinet on September 14, 2007 to advise her on preparing and implementing a statewide climate change strategy.⁸

Locally, several communities within Alaska have adopted climate action plans. These communities recognize that globally, the task of developing meaningful climate change related public policy

⁵ As cited in City of Homer Climate Action Plan, Dec. 2007, at 1. This document is available on line at <http://www.ci.homer.ak.us/CLPL.pdf>

⁶ Id.

⁷ See <http://www.commerce.state.ak.us/dca/ACCIMP.htm>

⁸ See <http://www.climatechange.alaska.gov/index.htm>

has fallen primarily to local governments.⁹ Anchorage's Mayor Mark Begich joined many of his colleagues from around the country when he signed onto the U.S. Conference of Mayor's Climate Protection Agreement. This agreement urges communities to meet or beat the standards set by the Kyoto Protocol agreement now signed by 172 nations (including the United States, though never ratified by the United States Congress). Most climate action plans, including those in Alaskan communities, adopt a two pronged approach to climate change: (1) promote policies that curb emissions-generating activities (mitigation) and (2) develop public policies that help their constituents adapt to the unique challenges posed by a changing climate (adaptation).

Although it has taken some serious steps to develop policies to deal with the challenges of Climate Change and Sustainability (recently making a huge leap into the arena of curbside recycling for example), the Municipality of Anchorage currently lacks a comprehensive plan that sets forth either mitigation or adaptation strategies. One of the biggest obstacles to drafting and implementing such a plan is the lack of baseline information regarding the Municipality's carbon emissions. This is critical information from which effective mitigation strategies could be developed.

The resources available to the MOA to develop a climate plan are likewise abundant. In addition to being part of the U.S. Conference of Mayor's Climate Protection Agreement, Anchorage is also a member of the International Council for Local Environmental Initiatives now known as ICLEI – Local Governments for Sustainability. ICLEI was founded in 1990 and was established when more than 200 local governments from 43 countries convened at its inaugural conference, the World Congress of Local Governments for a Sustainable Future, at the United Nations in New York. ICLEI is a membership association of local governments and national and regional local government associations that have made a commitment to sustainable development. Over 1000 local governments, representing over 300 million people worldwide, make up ICLEI. Anchorage stands prepared to take the next step in promoting a community that is dedicated to making a substantive change for the betterment of its citizens; it is time to take the next decisive step by passing a meaningful Climate Change Action Plan.

In addition to the existing departments in the MOA and to ICLEI, the Municipality is also fortunate to have a research and policy partnership with the University of Alaska Anchorage. During 2008, UAA faculty and students developed a Climate Change Action Team (C-CAT) to research and write a climate action plan to submit to the Municipality for their consideration as future public policy.

⁹ This is especially the case in the United States, as we are one of two developed nations to not ratify the Kyoto Protocol (the other being Australia). Kyoto imposed legally binding targets on developed nations that ratified it to reduce their greenhouse gas emissions by 5-7% compared to 1990 levels by 2012. The Kyoto Protocol became binding in February 2005.

Based on their research, the team identified six substantive topics that any climate plan should address: Energy efficiency, energy production, waste management, city planning, transportation and outreach and education. Each section describes the issue it covers, provides critical definitions of terms used, identifies resources and institutions already in place that could be used to implement appropriate policies, and offers suggestions for public policies reflective of both mitigating contributions to greenhouse gas emissions as well as offering thoughts on adapting to the existing challenges posed by climate change.

Although the following sections are the result of months long research conducted by C-CAT, it is imperative that prior to adopting any climate action plan, the MOA ensures it has the information and data at its disposal to ensure the plan has an impact. Most importantly, the C-CAT research team urges the MOA to allocate resources to develop a carbon baseline study.

Through sustainable development with attention to the issues of a changing climate we as a community can make choices that are not only environmentally friendly but also economically advantageous. Some measures that are being proposed in this plan, if adopted, will undoubtedly lead to significant cost savings for the Municipality of Anchorage. A measure that saves the Municipality money will inevitably save the taxpayers money as well. Anchorage residents will not only save money, but they will be able to live in a healthier environment. Truly this is a win-win situation.

Never has the expression “Think Globally Act Locally” been more relevant. Cities and towns throughout the United States are truly leading the path to better, sounder policy development that is in line with the core concepts and practices related to Climate Change and Sustainability. The Municipality of Anchorage stands on the edge of an opportunity to contribute to solutions rather than the problems of a changing climate. By developing far-sighted public policy in the form of a Climate Action Plan for the Municipality of Anchorage, we are fulfilling our promise for a better tomorrow not only for us but for future generations.

I. ENERGY PRODUCTION & SOURCES OF ENERGY

by Drew Cason¹⁰



Reeds grown to be used as biomass, outside of Tatabanya, Hungary.

The need for an integrated portfolio of energy sources is going to be a forced reality as hydrocarbons become ever more expensive and we seek to reduce CO₂ emissions. When we look to alternative energy sources, we see two obstacles: high initial cost, and in many cases reduced reliability. However, different projects have different strengths, and it is possible to develop a set of alternative energy sources that will meet demand and result in little waste.

In this section, we will attempt to sketch out a course that will lead the Municipality towards diversified, carbon-neutral energy production. Although the entire Railbelt shares a power grid, and Anchorage brings in power from the Kenai Peninsula at times, we will focus on generation projects that would primarily serve the Anchorage area, and are located near or within the municipality.

The following sections discuss the variety of energy sources available within the Municipality, examine their current status, and identify potential future actions for developing each energy type.

¹⁰ UAA Student, major undeclared.

Mission Statement

With regard to developing sources of energy for Anchorage, the goal should be to expand the types of energy produced in Anchorage to promote the use of wind, hydro, geothermal, tidal and bio-mass power in order to meet the current and future electricity needs of the Municipality of Anchorage with reduced costs and emissions in the long term.

Relevant Actors

1. Chugach Electric – A coop utility that supplies energy to most of Anchorage as well as other power companies on the railbelt.
2. Municipal Light and Power – Municipally owned electrical utility, owns its own leases on Cook Inlet natural gas and hence has a far more stable energy price than Chugach.
3. Cook Inlet Region Incorporated – An Alaska Native Regional Corporation developing wind energy on Fire Island.
4. Ocean Renewable Energy Corporation – A little known company that has purchased a number of tidal leases around the United States. OREC is currently engaged in testing their suspended helical turbine technology in Cook Inlet. But status unclear.
5. Matanuska Electric Association – Owns part stake in Eklutna hydro project, purchases the rest of its power from Chugach, but has aspirations to generate its own power. Recently attempted to build a coal plant, but were soundly rejected by Valley residents.
6. Enstar – A Natural Gas utility with a state regulated monopoly on supplying natural gas to Anchorage homes for heating.
7. The Producers – Conoco Phillips, Marathon and Unocal are three oil and gas companies who have leases on Cook Inlet natural gas fields. They sell gas to local entities like Chugach and Enstar.
8. State of Alaska – Impacts local energy costs on a number of levels, from regulating Enstar contracts and rates to offering subsidies for renewable energy projects.

Natural Gas

Natural gas is the source of a significant majority of Anchorage’s present energy portfolio. Not only is heat generated almost exclusively from natural gas in individual’s homes, but most of Anchorage’s electricity comes from Cook Inlet natural gas as well. Natural gas produces far less CO₂ than coals, and has far fewer impurities like mercury, sulfur and nitrogen, giving it a much smaller environmental footprint in every regard than other fossil fuels. Aside from being less polluting than coal, natural gas generators can be started up and begin generating electricity within about a half an hour,

whereas coal plants require nearly a day to get fully online. This on demand nature gives natural gas generators valuable flexibility as an energy source.

Current Actions:

Natural gas fired turbines in the Anchorage area are getting old. Beluga station, where a lot of Anchorage's electricity is generated (385 MW of 530 MW total capacity) as well as generators in the Municipality itself are far less efficient than new, state of the art turbines. This has prompted Chugach and ML&P to cooperate on a project to install 260 MW of new capacity near the Anchorage International airport at what they are calling the South Central Alaska Power Project.

Proven stocks of Cook Inlet natural gas are running low and as a result Chugach and to a degree ML&P's cost of power is going to increase substantially especially as the "Producers" export to expensive international markets. ML&P does own a third of the lease for Beluga natural gas, and so is less impacted by the price fluctuations that will impact Chugach as both gas becomes scarce, and developments like the Agrium plant in Kenai shutting down reduce baseload demand, making selling gas locally less profitable.

Future Actions:

Natural gas is not going to be replaced as Anchorage's sole source of electricity in the near future. It is unlikely even that it will be unseated in favor of a broader portfolio. The plans for new turbines in South Anchorage clearly show Cook Inlet natural gas will continue to be an important part of the municipality's energy future. Even if it were to be eliminated as an electricity source, natural gas from Enstar still heats Anchorage year round.

Therefore, the goals regarding natural gas should not be to rid us of it immediately, but to rather focus on more practical goals like reducing our consumption of natural gas without bartering it away for something better.

There are two key regulatory steps the municipality can pursue, net metering and peak use fees. Net metering simply requires that consumers be allowed to sell power back to the companies they purchase power from at the same price as that customer paid for his or her energy that month, that way said person only has to pay for the difference between their production and consumption. In order to protect the utilities from losing money, the Municipality may well need to partially subsidize the net metered power to provide for upkeep and maintenance costs.

The other means of reducing the demand for natural gas in particular is to institute peak use fees for both electricity and natural gas. This strategy has two benefits; the first is that for electricity, using less at peak times should reduce peak consumption, lowering the necessary maximum capacity. For natural gas peak use fees would add financial incentive for the community to balance its consumption so the daily peaks and valleys are muted, again, reducing the needed maximum capacity as well as providing for a far more stable rate of consumption.

Wind Power

One weakness in the municipality's energy portfolio is that we are currently a "one horse town" and it is clear that Anchorage is strongly reliant on natural gas. If prices were to truly spike, we would be in big trouble. Diversification is critical, and Fire Island represents an excellent first step down that path. Wind power is great because it is clean and powerful, and becoming increasingly cheaper to install.

Wind energy's major weakness is a lack of both control and reliability. If the weather doesn't cooperate, you could have zero production during the highest demand periods. At which point a utility would need to have enough capacity to meet peak demand with no support from the wind turbines from sources flexible enough to generate power on relatively short notice. The control you get with hydropower makes it a perfect compliment to wind, which would primarily serve to reduce the need for power from your base load system of natural gas.

Current Actions:

Fire Island was originally selected as the most viable of 40 potential sites examined for wind power near Anchorage. The Fire Island Project is currently underway, the 25 million dollars in state funding for transmission lines having put the project well past the tipping point for financial feasibility.

Future Actions:

Short Term:

Fire Island should be the municipality's key focus for short-term wind power. While it did appear under current actions, there are two things the Municipality needs to focus on for the future of Fire Island. The first is making sure the project actually happens. It would set extremely bad precedent if the State's funds were not utilized or worse yet, were wasted putting in transmission lines that never end up carrying power.

Mid Term:

Because there is currently only one major local wind project at any stage of advancement, mid range actions for the Municipality are not all clear. What is clear is that once the original Fire Island turbines go up, the municipality should work, via ML&P, to actively support the progression of the Fire Island project to its full 100 MW potential (the first stage is approximately one third of that).

Long Term:

Once the Fire Island project is successfully installed and producing electricity the Municipality and private companies will have a clear case study. Provided Fire Island is a cost effective means of generation, the Municipality continue to expand ML&P's wind portfolio. Because Chugach Electric is harder up financially, and lacks the natural gas leases owned by ML&P, it should be relatively easy to convince them to partner in further projects, and once the financial viability of wind energy in the Anchorage area has been demonstrated, finding partners in the private sector should also be relatively straight forward. In the long term, Anchorage utilities should look to areas near where other projects are going into place that would provide the transmission and construction infrastructure, such as Lake Chuckachamna or Mt. Spurr, to invest in further wind energy projects.

HydroPower

Hydropower is the most established of the renewable energies, providing nearly 10% of electricity in the United States. It is also the most established here in Alaska, with the Eklutna and Bradley Lake hydropower plants providing more than 10% of railbelt electricity consumption. Hydropower is especially valuable as an energy source because aside from being extremely cheap, hydroelectric units, particularly lake tap projects like Eklutna and Chakachamna, are exceedingly on demand, meaning they can be turned on and start producing electricity very quickly. They can also store up some energy by allowing the lake to fill more, so they are not just losing power if they are not being used the way wind or geothermal power would be.

Current Actions:

Eklutna and Bradley Lake are the two largest hydro projects serving the Railbelt (and by extension the municipality) they are 37.5 and 90 MW respectively, and combine to produce more than 10% of railbelt power. While Southeast Alaska gets a lot of its energy from hydro projects, Southcentral Alaska lacks the installed capacity, though the potential is certainly there. There has long been a push to dam a portion of the Matanuska-Susitna River, most proposals of which would produce a substantial portion of Anchorage's energy needs; but environmental concerns have prevented any development, despite promised federal funds.

Future Actions:

The first item on the municipality's hydropower agenda should be the Chakachamna lake project. Because the Chakachamna generation facility would be at the end of a tunnel drilled up through a mountain, it would not require a dam or the associated impact on existing streams and by extension critical salmon habitat. Chakachamna is different than Eklutna in the matter of scale, however, it is much bigger (nearly 10x the maximum capacity), but even then it is still not nearly as large as the Devil's Canyon Proposal for the Susitna River. A key benefit to the Chakachamna project is that the proposed project's turbines are located where very near to the existing Beluga Natural Gas power station and transmission infrastructure is already present to bring the energy to Anchorage.

While the municipality cannot be expected to foot the bill to construct this project, it is absolutely capable of facilitating development. Much as the state was able to reduce the barrier of transmission lines from Fire Island, the municipality via ML&P and its influence in Chugach Electric should be able to make the Chakachamna project ready for development. One means of achieving this would dovetail nicely with interests in Mt. Spurr geothermal, which is the construction of energy infrastructure out to the Chakachamna/Mt. Spurr area, approximately 40 miles from existing transmission lines.

The real crown jewel of all development minded hydropower proposals in Alaska has always been a dam on the Susitna River. Though the issue has been debated for years, it has been given new life of late by the Alaska Energy Authority. Tasked with canvassing the state for potential energy sources, the AEA should be releasing it's final report soon, one major component of which will be a multimillion dollar renovation of the mothballed plans the legislature spent over 100 million dollars on in the 1980's for a huge hydropower project on the Susitna river. The proposed project could well supply as much or more electricity than Alaska currently consumes. Whatever the product of the AEA's report, Anchorage should be involved, from caucusing for public input from conservation groups to evaluating our potential use of electricity fro the dam, Anchorage's voice should be involved in what is certainly going to be a state and federal discussion.

Tidal

Tidal energy is tremendous. Every day, unspeakable volumes of water move back and forth in a regular and predictable manner. Because of water's substantial density, the energy accessible in this motion is potentially vast; the only question is how to tap into it.

Current Actions:

Cook Inlet has some of the strongest tides in the world, and as a result is a truly premier location for what is emerging as a potent energy source. Ocean Renewable Power Company (ORPC) is a company that has bought up leases on potential tidal generation sites around the United States, including Cook Inlet. For their first round of feasibility testing on their potential generation method (suspended helical turbines) ORPC has chosen three of their best sites to run tests, one of these are Cook Inlet.

Future Actions:

Short Term:

There have been allegations levied that ORPC is not, in fact, interested in becoming a power generation company, but is rather attempting to benefit from a growth in the tidal power industry by purchasing as many high quality leases as possible, and then selling them off once tidal generation becomes more established. The municipality and the State of Alaska should be wary of such inactivity and ensure that test projects are in fact going into Cook Inlet. Recognizing the listing of Cook Inlet Beluga whales as a protected species will provide barriers to development, the Municipality should actively work with conservation advocacy groups to enlist their support in assuring that the tidal technologies tested are low impact, and would not negatively impact Beluga habitat. An example of what not to do would be the proposed barrage under a bridge between Anchorage and Point McKenzie, such an installation would have tremendous negative environmental impact, and is not realistically feasible with the Beluga's recent listing.

Mid Term:

Not only should Cook Inlet be the site for early testing of tidal generation technology, but also once a few methods of generation are established as those most efficient, Cook Inlet should be among the first to receive full-scale pilot projects. As was mentioned, already Cook Inlet has some of the greatest raw tidal potential in the world, so nature has done its part; it is now up to our governing bodies, like the municipality to make sure that the Anchorage area stays in the lead pack of testing sites, rather than allow us to fall into the peloton of major developments. Examples of how we could accomplish this include providing energy infrastructure to get power into the grid, and working with utilities to come up with a system that can effectively utilize the daily power rhythms of the tides.

Long Term:

There is no reason that Anchorage should not gain a substantive portion of its base load power from tidal generation. Whatever the method of access, the kinetic energy in tidal power is both vast, and predictable; making it more dependable than wind power with equally limited environmental impact. While it is not a power source that can be cranked up to meet demand the way Eklutna or Chakachamna can/could be, it should still absolutely be on the Municipality's radar when looking to construct a sustainable energy portfolio.

Biomass

Biomass power generation consists of burning combustible biological material and converting the thermal energy released to create electricity. This is an inherently carbon neutral process because by producing fuel for the generation process, you fix carbon from atmospheric carbon dioxide.

Current Actions:

Though Anchorage is no tropical rainforest, we do have a lot of trees, and as a result we end up with a ton of waste wood. At present we subsidize wood lots as locations for people to deposit waste wood, but we don't really do anything useful with it.

Future Actions:

Such a situation presents a perfect opportunity to build a couple megawatt plants to burn tree clippings from around the Anchorage bowl, Christmas trees, people's leaves, etc. If we ever needed additional fuel, it would be a simple matter to set aside a few acres for growth of fast growing indigenous plants like willow and alder to supplement the present supply organic waste. This would be helpful to our waste management system, as it would reduce the amount of organic waste currently being dumped at the landfill.

Geothermal

Geothermal power is energy derived from the heat at the center of the earth. Geothermal power as well as geothermal heating has been used to great effect in Iceland, and recently an innovative new type of geothermal generator was installed at the Chena Hot Springs resort near Fairbanks. Generally speaking however, geothermal power remains an emerging form of electricity generation, not a new concept by any means, but lacking the established status of hydroelectric or even solar or wind power.

Current Actions:

Mt. Spurr, an active volcano near Anchorage, has been identified as the site with the greatest potential in the immediate vicinity, and leases were recently auctioned off on the land considered most suitable for potential electricity generation. One company bought all but one of the leases, a total investment of 3.5 million dollars. Exploratory drilling is set to commence in the summer of 2009, the nature of the volcano making any development in the area potentially precarious.

Future Action:

Because a private investor has already self identified as being interested in developing a project in the area, and made a multi-million dollar commitment, promoting development should be relatively easy. The municipality should keep close contact with the developers, and when a little more is known about the nature of the resource, consider extending investment through ML&P as well as looking to coordinate transmission and construction infrastructure with the Chakachamna hydropower project, the proximity of these two projects should make each substantively more cost effective.

Once development begins in the Chakachamna/Mt. Spurr region, other projects, be they small geothermal sites or corridors of high wind density should be identified, and if possible tied into this network. The area has shown a great deal of potential for alternative energy development and its potential to be the site of a diverse number of energy sources is excellent.

II. ENERGY EFFICIENCY

by Joelle Brown¹¹



A highly energy efficient home in Tromso, Norway.

Energy efficiency is at the heart of mitigating contributions to greenhouse gas emissions that are at the heart of our changing climate. In addition to mitigating climate change contributions, promoting energy efficiency results in lower costs to consumers and businesses, and the path toward energy independence will become much shorter. Public policies that promote energy efficiency are unique

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because they can be pursued on all levels of society. The most crucial component of reducing energy use is that it becomes part of the culture of our community to use less energy. Energy use needs to be expanded from an individual issue into a community issue that is tackled at the community level. The municipality has the power to do this through education and incentives. Anchorage has the potential to transform itself into an energy efficient city.

The Municipality of Anchorage's energy users include (1) municipal government (2) private businesses and (3) individuals. All have different needs for energy, and all have the opportunity for savings with a few simple adjustments to the way they use their energy.

Mission Statement

Energy efficiency is best tackled through two key areas: energy conservation (using less energy), and energy efficiency (making the most with the energy we use). Anchorage can benefit from these two ideas through practicing them in water use, weatherization efforts, and promoting general efficiency/conservation efforts.

Relevant Actors

1. The Municipality of Anchorage houses a sustainability director whose position was created to reduce waste and promote sustainable practices in municipal government. Municipal Light and Power is the municipality's energy company that powers homes and businesses.
2. The Alaska Housing Finance Corporation is a state agency with a home energy audit program, which performs the same function as the municipality's Department of Neighborhoods, which has an income-based weatherization program. This program has been funded by the Alaska State Senate to help families save money on their heating bills by inspecting homes for possible changes that can be made, which are then subsidized by the municipality depending on income, and the families then save money on their heating bills. The inspectors make recurring visits to check for any further changes that can be made.
4. Greenstar is a non-profit private entity that rates businesses based on set standards that have been developed to save energy and save money.
5. The Renewable Energy Alaska Project (REAP) is a coalition of various organizations and businesses throughout Alaska that wish to develop renewable energy resources in Alaska.
6. The Alaska Building Sciences Network (ABSN) is a coalition of businesses and organizations that strive to create and maintain safe and affordable housing in Alaska.
7. The Alaska Center for the Environment (ACE) is a group of citizens who raise awareness about protecting Alaska's natural environment.

8. ICLEI-Local Governments for Sustainability is an association of international local governments that are committed to sustainability.
9. Leadership in Energy and Environmental Design (LEED) is a certification program that rates buildings' energy use. The certifications are classified on a silver, gold, and platinum standard.
10. Net metering is the term used for the individual's proactively of developing renewable energy on their own accounts and selling their surplus energy back into the grid.

The following describes the three levels of energy users, how each deals with energy, water and weatherization, and short, mid and long-term goals for each.

Municipal Users

The city has a unique opportunity to set an example of how much money can be saved with just a few changes to habits, routine, some appliances, and attitude. The city can encourage municipal employees to lead the efforts of saving valuable resources, which will then save money, and this will be used as an example throughout the Anchorage community.

A. Energy: Energy can be characterized as anything that powers anything. This includes the automatic shut-off monitors that Mayor Begich introduced in 2007 that saved the municipality \$84,000. These kinds of small innovations can save taxpayers money and put Anchorage on the map as an example of a sustainable community, both economically and environmentally.

Short term action plan: The municipality will conduct an investigation of the carbon footprint of Anchorage. Then the municipality will work to improve this number, which will improve Anchorage's livability in terms of air quality and standard of living. This will achieve a constant evaluation on where Anchorage stands in terms of carbon emissions and where we could be.

Mid term action plan: The municipality will make adjustments to city buildings and municipal facilities to become more energy efficient. This will maximize the possible energy savings for the municipality overall by decreasing the amount of money spent on energy use. Anchorage city buildings will achieve gold LEED standard by following certification requirements. LEED gold standard is one step higher than our current LEED goal of silver.

Long term action plan: The municipality will continue to make adjustments at the recommendation of Greenstar, as well as other agencies within Anchorage. The municipality will also become a leader for the ICLEI program, showing how a winter city can become energy efficient. Anchorage

municipal buildings will also reach platinum LEED standard. The city will also develop a net metering program for its own buildings as well as businesses and individuals. The municipality will become energy efficient and reduce the collective carbon footprint as well as reducing taxpayer money spent on energy bills.

B. Water: Water is used by the municipality to keep public parks green, and to flush toilets and provide a quench for summer thirst at a water fountain. The municipality provides these services to the community, and there are ways the municipality can save the community money by taking a few steps to update facilities and simply fix leaks around town.

Short term action plan: The municipality will conduct an assessment about the way it uses water, and will consult outside agencies to aid in this assessment. These agencies include Greenstar, ABSN, ACE, as well as utilizing the LEED standard system.

Mid term action plan: The municipality will then make the necessary changes toward water conservation in order to save the most money. It will utilize water saving appliances, such as low-flow toilets, water conservative shower heads and sink faucets, and will use lawn care techniques that maximize the efficiency of the water used during the summer months. Every city water usage will be evaluated and efficiency standards will be applied.

Long term action plan: The municipality will continue to make adjustments at the recommendation of Greenstar, as well as ABSN, ACE, and the LEED standard program. The municipality will reduce its energy use through reducing water use, which will save taxpayer money and reduce dependence on outside energy sources.

C. Weatherization (heat): The municipality is responsible for some of the largest buildings in town. If the Loussac Library had triple-paned windows, it could save thousands of dollars per year in heating bills. These small changes can be made with a few steps, and a few dollars upfront. But it will save money and valuable natural gas in the long term.

Short term action plan: The municipality will subject itself to the Department of Neighborhoods' weatherization investigators to determine how heat efficient city buildings and other facilities are. These investigators will check the physical characteristics of city buildings to see if there are leaks in window or door seals, as well as recommending arctic entries, which is an area between two doors leading into a building to conserve the heat that is lost when a door is opened.

Mid term action plan: The municipality will then make the adjustments necessary to conserve heat that is generated in its facilities. This includes installing triple-paned windows, re-sealing doors, creating arctic entries where they do not exist, and making the insulation more efficient and creating an overall heat retention strategy for the municipality to maximize savings from heat that is currently being lost.

Long term action plan: The municipality will consult regularly with the Department of Neighborhoods as well as Greenstar to continue their heating bill savings. They will also develop new ways to conserve energy through heating, and implement these new ideas. These new ideas will help future building engineers create more heat-efficient buildings in Anchorage, which will save many taxpayer dollars.

Businesses

Businesses have the startling position of maintaining Anchorage's economy while the economy is not moving as fast as it could. Because of this the municipality should support businesses by giving them this important opportunity to save money.

A. Energy: Businesses use a lot of energy in Anchorage, no matter what that business may be. For example there are 28 listed tanning salons within the municipality that could directly benefit from small changes with their energy use.

Short term plan: The municipality will provide incentives to businesses that undergo Greenstar inspections of their carbon emission footprint. Incentives can be tax cuts or recognition. With the municipality's efforts to make their own buildings more energy efficient a trend will be created which will encourage patrons to use businesses that care about saving money through energy efficiency. If a business spends less money on energy there could be lower prices on products or services that could interest a potential patron.

Mid term plan: Provide businesses with financial incentives to meet the Greenstar Standards by the municipality subsidizing changes that are made to become more energy efficient. Businesses will meet Greenstar standards and save themselves money, as well as saving ML&P energy. Participating businesses will also have the opportunity to meet a LEED silver standard, which is what Anchorage municipality buildings have currently achieved.

Long term plan: Businesses will continue to consult with Greenstar about other opportunities to be more energy efficient. Businesses will also achieve gold LEED standard, and have additional in-

centives to achieve platinum standard. Further, businesses will be urged to participate in net metering on their properties. Eventually businesses will be on the same energy use as municipal buildings, and save money on energy, and reduce dependence on energy producing utilities. This will save the city money in energy subsidies.

B. Water: Water is a major resource for businesses and most must use water. Within the restaurant industry water is incredibly important for the product itself, as well as maintaining sanitization to health codes, and also things like bathroom toilets and sinks. Businesses could benefit from some solutions to over-use of water and save money.

Short term plan: Businesses will be urged to evaluate their water use through tax cuts and recognition. This evaluation will be conducted with Greenstar, ABSN, ACE, and also be consistent with the LEED certification program.

Mid term plan: Businesses will alter their water usage facilities, such as installing low-flow toilets and using efficient dishwashers to decrease their water use. The municipality will subsidize the costs of these utilities with the money that has been saved with municipality water usage decrease savings. This will be an example of how profitable energy conservation can be.

Long term plan: Businesses will review their water usage regularly, and look for more opportunities to be water efficient. This will save energy as well as water for the city. It will also encourage business ingenuity, and help businesses save money. Anchorage business will be more profitable, boosting the local economy.

C. Weatherization: Businesses can benefit from access to the Department of Neighborhoods program because the cost of heating can get so high, and in January and February a leaky seal around a window can overpower any heat that is in a room. It is essential that businesses be given access to weatherization to save as much money as they can.

Short term plan: Businesses will be given incentives to participate in a heat efficiency inspection by the Department of Neighborhoods. The Department of Neighborhoods has a program which inspects buildings to determine what changes can be made to make that building more heat efficient. These suggestions will be custom for each building, which makes these inspections and the inspections valuable.

Mid term plan: Businesses will make the changes recommended by the Department of Neighborhoods and conduct those changes which will be subsidized by the municipality. The subsidies will encourage businesses to make expensive changes to their buildings in the short term for large savings in the future. In this way the municipality will encourage forethought in businesses, which will help with the future economy, as well as the future environment in Anchorage.

Long term plan: Businesses will have routine inspections to determine if there are any further changes that can be made which will save them money from heat loss. This will keep the focus on heat efficiency, which helps steer the vision of Anchorage businesses to maintain a livable city for their patrons as well as their employees, and themselves. They will save money from heating bills, which will conserve energy that will not have to be produced.

Individual Users

The municipality should support the individual's efforts to save money by conserving energy use. This is important because with the remote location of Anchorage from the rest of the country, when choosing a location to live and work the cost of living is increasingly an issue. If a large portion of an individual's income is spent on maintaining energy costs, their decision to live in Anchorage may be compromised. Anchorage also needs retention of citizens to maintain the economy and the life of the municipality.

A. Energy: Individuals use energy in their homes and at their places of work. It is often thought that an individual can make a difference, and this is especially true with energy use. The municipality should support an individual's choice to reduce their energy use to save money because energy costs affect an individual's quality of life, especially when the State Senate is writing energy subsidy checks.

Short term plan: Individuals will have the opportunity to learn ways to become more energy efficient within their private residences, and they will be given the opportunity to analyze their energy emissions through an Alaskan lens, as most individual methods available online do not take into account the weather and distance required to travel within the continental United States.

Mid term plan: After evaluation individuals will be given the opportunity to be creative and develop strategies that will help their communities become more energy efficient and save the maximum amount of money. The municipality will subsidize basic energy-saving appliances, such as light bulbs and washing machines.

Long term plan: Individuals will be given the opportunity to review their energy efficiency and make further changes that will be subsidized by the municipality. Individuals will be given the option to tap into a renewable energy source if it is in proximity instead of paying for energy that is mass-produced for consumption. In this way, individuals will have more control over how much money they spend to live in Anchorage that will retain citizens and raise quality of life, which may attract future residents.

B. Water: Water is used by everyone in a variety of ways. It is essential to understand the ways in which water is used, and further, how much energy is used when the faucet is turned on. It should be habit for every resident of Anchorage to refrigerate water instead of running the faucet until the water gets cold, and residents should only take ten-minute showers. This will help the municipality's water demand needs, and reduce energy bills for citizens of Anchorage.

Short term plan: Individuals will be given the opportunity to evaluate their own water use and be given tips to save water and be notified of their water saving potential. If an individual is notified that they could easily save money by watering their lawn every other day instead of every day, or only running the dishwasher when it is full, individuals have more control over where their money is going.

Mid term plan: The municipality will subsidize changes for the individuals involved and subsidize repairs and replacements to maximize water savings. This will encourage the municipality of Anchorage's culture to reduce water and energy consumption. Citizens should be able to enjoy the same benefits that are available to the municipality, as taxpayers. This will attract new residents who will see Anchorage as a municipality that values their residents' choice to conserve and maximize quality of life by reducing energy bills.

Long term plan: Individuals will be given the opportunity to review their water savings potential and have any changes they can make subsidized by the municipality. This will encourage an individual to make water conservation a habit, which will save them more energy, and reduce their bills just as the municipality will have. This will encourage less water use and therefore less energy use, which will create a more livable municipality for individuals by increasing quality of life by reducing energy bills.

C. Weatherization: An individual has a special relationship with the cold Anchorage winters, and they should therefore have more say in how warm or cold they are. The municipality should help an individual with the endeavor to keep their home warm, without having to choose between the heating bill and the grocery store.

Short term plan: Individuals will have the opportunity to have their homes inspected by the Department of Neighborhoods. Their homes will be evaluated for their heat efficiency and suggestions will be made. This will give individuals control over how much they spend on their heating bill.

Mid term plan: The suggestions offered by the Department of Neighborhoods will be subsidized by the municipality and individual homes will become more heat efficient which will save money for the individual, increasing their quality of life. An individual should have the opportunity to save money on their heating bill if the municipality has the resources, which it does. Energy subsidies are short term. Individuals need to be able to have a say in how much it costs to simply stay warm over winter months, because Anchorage is a winter city and weather needs to be taken into consideration.

Long term plan: Individuals will have the opportunity to have their homes reviewed by the Department of Neighborhoods periodically to have suggestions made to maximize their heat savings. The municipality will subsidize any changes that can be made. This will encourage individuals to stay in Anchorage instead of moving somewhere out of state that does not require a heating bill. An individual should not be penalized because it is simply too expensive to live in Anchorage. The municipality needs to do whatever it can to reduce costs for individuals, and maximize an individual's heating bill savings.

III. CITY PLANNING

by Kelcie Ralph¹²



Budapest, Hungary

City planning strategies provide a unique opportunity to shape the future of our cities. The old cities took shape with the convenience of cheap and abundant fuels, and seemingly endless spaces in which to expand. These developments, although still important, are becoming increasingly less popular and more expensive. Demographic shift and changing financial situations have led to a new desire for convenient, affordable, livable cities. Anchorage has the opportunity to respond to these concerns with proven smart growth strategies.

Municipalities across the country have taken steps to make their cities more vibrant, diverse and efficient. Smart Growth plans are one such strategy that focuses on developing the city core with a variety of residential and commercial options and a number of transportation choices. These plans typically aim to maintain existing infrastructure and prevent inefficient, sprawling communities. Transportation Oriented Developments (TOD's) are another option for municipalities. These developments aim to create higher density districts around transportation hubs. This encourages mass transit

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ridership, which reduces congestion, improves air quality and helps residents deal with rising fuel costs. These developments also create livable, walkable communities where small businesses can flourish.

Mission Statement

Through thoughtful land use management strategies Anchorage will become a vibrant community with diverse neighborhoods, convenient amenities, beautiful parks and a variety of transportation options.

Relevant Actors

Planning and Land use management is the responsibility of many different departments at the Municipality of Anchorage.

1. Anchorage Metropolitan Area Transportation Solutions (AMATS):
 - Developed a Long Range Transportation Plan
 - Developed the Non-Motorized Transportation Plan, which combines the Pedestrian Plan (developed from 2005-2007), the Bicycle Plan (developed 2007-2008) and the Area wide Trails Plan (2008-2009).

2. Planning Department:
 - Developed the Anchorage 2020 Comprehensive Plan, which was approved by the Assembly in 2001. This document was to serve as a blueprint for development in the Anchorage Bowl.
 - Developed Title 21, which aims to implement the goals and strategies of the 2020 Plan.
 - Developed the Downtown Anchorage Comprehensive Plan and is working to develop the Midtown District Plan.

3. Department of Neighborhoods:
 - Worked with the U.S. Department of Housing and Urban Development (HUD) and has developed the 2008-2012 Consolidated Plan.

These departments have each made great strides to outline a course of development for our municipality. Through innovative work with outside consulting firms, input from local community members and the hard work of municipal planners Anchorage has a strong foundation to guide growth for years to come. These plans offer a gateway to shaping Anchorage into vibrant, livable city in the coming years. The guidelines in the numerous plans mentioned can serve as a starting point, but it is essential that concrete actions begin to shift the face of Anchorage.

Anchorage will benefit greatly by following the guidelines of the above-mentioned plans and by addressing the opportunities and challenges outlined below.

The municipality should work to limit sprawling development and allow new developments to “pay their way” by implementing impact fees.

An impact fee is a charge to developers to pay for the construction or expansion of capital infrastructure necessitated by the new development. The municipality should implement impact fees for development outside of the city core. These fees will help cover the expansion of city services (i.e. schools, fire services, police services, etc.) into new areas and require that new developments “pay their way.” Such fees also provide a disincentive for sprawling developments because it increases the relative costs of those properties. Impact fees are most effective when implemented regionally, so Anchorage should make efforts to work with members of the Valley and Eagle River on this concept. Impact fees are becoming more popular as cities deal with the impacts of sprawl and rapid growth. Furthermore, developer opposition to these fees is steadily declining because it provides an even playing ground for developers prevents haggling for exaction fees and reduces the uncertainties of the permitting process.

Current Action: The municipality currently charges new developments a fee to cover the cost of expanding some municipal services.

Short Term:

- Assess use of impact fees in other communities. Identify areas that could be good candidates for implementing impact fees (i.e. urban-rural divide in the Anchorage 2020 Plan)

Mid Term:

- Work with stakeholders to pass legislation implementing impact fees in Anchorage.

Long Term:

- Work with Regional partners to coordinate impact fees in multiple municipalities to send clear regional signals to developers and prevent race to the bottom legislation.

The municipality should utilize its space more efficiently by providing support for Urban Redevelopment and Refill policies.

As Anchorage continues to grow, we must develop desirable livable communities. Anchorage can develop these communities by subsidizing and supporting urban redevelopment and refill. The 2020 plan calls for extensive use of this strategy. Urban redevelopment is the process of convert-

ing underutilized land in urban areas, into vibrant, viable mixed-use districts. Refill should not be implemented in a haphazard, piecemeal way. It should instead work to fill gaps in the community fabric by adding residential spaces, community and cultural centers, commercial opportunities and convenient amenities.

Anchorage should work to incentivize redevelopment and refill through tax breaks, ‘super’ accelerated permitting, waiving of the impact fee or other measures.

Current Action:

- The Anchorage 2020 Plan calls for extensive use of urban refill and redevelopment policies.

Short Term:

- Identify areas for urban redevelopment. The Anchorage 2020 plan can be used as a starting point as it has clearly identified several areas for refill potential.

Mid Term:

- Change zoning codes to allow the development of mixed use, high density, walkable communities. Areas should be developed to meet the needs of different income levels and family types. Efforts should be made to locate essential amenities, such as grocery stores and post offices, within walking distances. Zoning should require new developments to be located close to the road and having parking in the rear.
- Provide incentives for developers to go above and beyond zoning guidelines by identifying quality workmanship and rating new developments.

Long Term:

- Offer tax incentives for new businesses and residential homes to relocate to refill areas.

The municipality should help develop neighborhoods where residents have a variety of live, work and play options by zoning for Mixed Use Developments.

Mixed-use zoning creates livable, walkable communities. It also encourages small business development. New zoning measures in Portland have proven successful at converting commercial districts into thriving communities. Areas should be developed to meet the needs of different income levels and family types. Efforts should be made to locate essential amenities, such as grocery stores and post offices, within walking distances. Zoning should require new developments to be located close to the road and having parking in the rear.

Current Actions:

- The Anchorage 2020 Plan calls for a shift to Mixed Use Development.

Short Term:

- Pass the new zoning ordinances of Title 21. It is time Anchorage's zoning reflected the goals and desires of citizens in the 21st century.
- Identify external funding sources such as the EPA Smart Growth Grants to secure outside funding for implementing innovative land use management strategies.

Mid Term:

- Identify outdated zoning codes not covered by the Title 21 rewrite and work to revise them in the spirit of mixed use and high density development.

Long Term:

- Allow all Anchorage residents, regardless of race, income level or location, to benefit from Mixed Use Developments. Insure that this type of amenity is affordable in all corners of the city.

The municipality can make a variety of transportation options available to residents by integrating new commercial and residential developments with existing and planned transportation facilities.

Efforts should be made to develop transit corridors in Anchorage. These corridors may take the form of frequent bus lines, or potentially a new commuter light rail. It is essential that such corridors include high-density housing and mixed use zoning, because density is directly correlated with mass transport ridership. We can learn from the success of Seattle and their newly constructed transit hub. The hub and surrounding buildings were constructed in a commercial district and city officials expect a livable community of over 3,000 people.

Current Actions: Several of Anchorage's long term plans call for improvements in public transportation such as expanded routes, more frequent bus service, and safe bus shelters.

Short Term:

- Work with the People Mover to collaborate on the future of transit in Anchorage.

Mid Term:

- Identify undeveloped areas that could serve as new Transportation Oriented Developments (TOD's). The city should use zoning ordinances to create higher density, vibrant, mixed use communities in these locations. Collaborate with the People Mover to insure that new residents and business will have access to frequent and reliable transportation options.

Long Term:

- Insure that all Anchorage residents have affordable, safe and convenient transportation options in their neighborhood.

The municipality should encourage responsible architecture by implementing Green Building Standards for new construction and renovation projects.

Green Building Standards are a proven method of greening a city. These standards call for new buildings to abide by more stringent interior air quality standards, more efficient lighting, heating and air conditioning, better insulation and many other important environmentally friendly standards. These types of development were initially significantly more expensive to build than traditional buildings. This price premium is steadily declining and the small increase in upfront costs is typically recouped quickly due to reduced energy and electricity costs. In fact, these developments can serve as a long term cost savings mechanism because they are significantly less expensive to maintain and operate than other buildings. This fact is especially appealing at a time when the State has a surplus, but the future of State revenues is uncertain.

Current Actions:

- The city has approved a progressive LEED standard for municipal buildings.

Short Term:

- Provide information about LEED standards and the benefits of this type of development to contractors and the general public. Doing so will raise awareness about the municipality's move towards LEED certification and may raise interest in green building standards.

Mid Term:

- Extend LEED requirements to commercial buildings in Anchorage. The standards should get marginally stricter every five years (or other length of time) so that developers can plan ahead to meet future goals. The unfortunate consequence of this type of progressive standards is that it encourages rapid construction in order to complete projects before a new, stricter standard becomes law.

Long Term:

- Extend LEED requirements to new residential developments. Again, implement increasingly more stringent standards so that developers will be using the best practices possible when they build our homes.

The municipality should preserve Anchorage’s reputation as a beautiful place to live, protect biodiversity, maintain important habitats and sequester greenhouse gases by protecting and maintaining parks and green space.

Anchorage’s stunning beauty and remarkable wildlife make it a highly desirable place to live and visit. Protecting green spaces can insure that this fact holds for generations to come. In addition, green spaces serve a number of other important functions as well. Green spaces not only protect the biodiversity and wildlife of Anchorage, but also serve as carbon sinks.

Anchorage has a wide variety of parks and green space throughout the city. Efforts should be made to continue to integrate these spaces into new developments.

Current Actions:

- The municipality is currently working on completing the Area Wide Trails Plan.

Short Term:

- Identify potential sites for greenbelts and parks in Anchorage. Work with stakeholders to develop a set of incentives to preserve these green spaces (i.e. tax breaks on undeveloped land, city purchase of lands etc.)
- Require new developments to protect established landscapes and incorporate green spaces into their design.
- Expand the Community Gardens program by developing one new garden every two years.

Mid Term:

- Green the Anchorage Public Schools by planting trees around the perimeter of schoolyards. This program will introduce students to horticulture and foster improved relations with the environment. In addition, several Anchorage schools are located next to major roads and the new trees will serve as a wind and noise block for our students.
- Create new parks, gardens and greenbelts by converting underutilized parking lots and street corridors to parkland.

Long Term:

- Improve the quality of life by insuring citizens in the Anchorage bowl live within walking distance of a park.

The municipality should create a safe, walkable community by developing Parking Lots and Sidewalks with the Pedestrian in mind.

For each new development, the municipality requires a certain number of parking spaces. This inflexible requirement is based on the square footage of the building and assumes that each visitor drives a single occupancy vehicle. Such a requirement does not account for trips by alternative means, such as by bus, by bike or by walking. This policy can lead to unneeded parking spaces, which is a waste of money, is harmful to the environment and creates less walkable communities.

Sidewalks in Anchorage are often not conducive to travel by foot. Sidewalks end abruptly, are often not wide enough for passing, are often covered in snow and tend to be along busy streets with unaware drivers. It is not fair to expect citizens to walk around town if doing so is a hazard to their health and safety. Efforts must be made to make Anchorage a safe and convenient place for pedestrians of all ages.

Current Action:

- The municipality has passed the Long Range Transportation Plan and the Anchorage 2020. Both documents incorporate pedestrian friendly sidewalks.

Short Term:

- Create a new parking standard that keeps the pedestrian in mind. Buildings should be accessible to the pedestrian from the sidewalk and buildings should be in close proximity so people can walk, not drive, between locations.
- Insure walking is safe and convenient by keeping sidewalks well-lit and free from snow.
- Develop zoning codes that require awnings to protect walkers from snow and ice and require wide sidewalks on each side of the road so pedestrians have a clear zone for walking.

Mid Term:

- Reduce the number of required parking spaces by accounting for trips by alternative means. Encourage developers to make amenities available for pedestrians such as benches, covered bike racks, etc.
- Identify currently underutilized parking lots and work to open them for urban refill and mixed use development. This will increase density, improve efficiency and allow pedestrians to walk comfortably within their communities.
- Discourage the development of traditional parking lots. Instead, work to develop centrally located parking garages that can serve a wide variety of shops, restaurants and businesses.
- Create a Pedestrian Only zone in Downtown Anchorage. These zones are beneficial for tourists and residents alike and help small businesses flourish.

Long Term:

- Convert underutilized parking lots and streets into parkland, public squares and greenbelts. Such amenities greatly improve the quality of life and help cultivate vibrant, livable communities.

IV. TRANSPORTATION

Marcus Welker¹³



Wind energy at work in Tromsø, Norway.

Mission Statement

Public transportation, improved pedestrian facilities, and efficiency measures have the power to transform the development of Anchorage into a sustainability-designed future.

This section of the plan will focus on mass transportation issues. Mass transportation is extremely vital to the development of modern cities and can help Anchorage reduce its greenhouse gas emissions. Expanding mass transportation options would have many benefits for our community, such as improved resident health and traffic reduction.

The current provider of public transportation in Anchorage is the Municipality of Anchorage's (MOA) Public Transportation Department (PTD). The PTD provides three critical services. All of these services increase the mobility of MOA citizens and visitors, and help to reduce Anchorage's carbon footprint by creating a means for using mass transportation in South Central Alaska.

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The People Mover (PM) fixed route bus service offers 16 different bus routes in Anchorage, Eagle River, Chugiak, and Peters Creek.

AnchorRIDES provides paratransit service for senior citizens, people with disabilities, and others unable to use the bus system. The goal of the AnchorRIDES program “is a shared ride service providing curb-to-curb trips ... to people with disabilities that prevent them from using [the People Movers] fixed route system.”¹⁴ AnchorRIDES also provides senior transportation in accordance with the Older Americans Act.

Share-a-Ride carpool and *Vanpool* services are Carpool RideMatch programs offering a “ride-sharing resource for carpooling and vanpooling in the Anchorage and Mat-Su region.”¹⁵ The Share-A-Ride Van Pool program “works to reduce traffic congestion and improve air quality by promoting alternatives to driving alone.”¹⁶ This service operates from Wasilla to Girdwood.

In order to for Anchorage to meet the demands of a changing climate politically, economically, and environmentally, and to meet the US Mayors Climate Protection Agreement goals signed by Mayor Mark Begich in 2005 such as a 7% reduction of eCO₂ by 2012, Anchorage must focus on:

- The continued development of the PTD programs
- Improved pedestrian facilities and non-motorized facilities, and
- Increasing the efficiency of the current transportation options in the MOA.

Relevant Actors

In order to understand mass transportation and possible future actions, it is important to understand who the current players are in the transportation arena.

1. Municipality of Anchorage’s Public Transportation Department, sanctioned by local voters in 1973. The goal of the Department is “to provide safe and efficient public transportation that serves Anchorage residents and visitors.”¹⁷

14 People Mover AnchorRIDES website. <http://www.muni.org/transit1/anchor.cfm>

15 People Mover RideMatch website. <http://ridematch.muni.org/>

16 People Mover Share-A-Ride website. http://www.muni.org/transit1/share_2.cfm

17 People Mover About website. <http://www.muni.org/transit1/about.cfm>

2. Public Transit Advisory Board (PTAB) who advises the assembly and the mayor. The PTAB consists of 9 people of which at least 2 shall be disabled. The goal of the PTAB is to “contribute to the long range planning of a balance transit system in the [Anchorage] municipality.”¹⁸
3. Alaska Mobility Coalition whose mission is to achieve mobility through community appropriate transportation services.
4. Anchorage Metropolitan Area Transportation Solutions (AMATS) planning process. AMATS is a city and state coordinated planning process to set priorities for spending federal funds for highways, roads, trails and related improvements. AMATS is also responsible for preparing the community’s Long Range Transportation Plan. Employees of the Municipality of Anchorage’s Traffic Department, Transportation Planning Division, provide the primary staff for the AMATS Policy Committee. Secondary staff comes from the Alaska Department of Transportation & Public Facilities (ADOT&PF) and the Alaska Department of Environmental Conservation (ADEC). In addition, the Policy Committee gets input from the Anchorage Municipal Assembly, the AMATS Technical Advisory Committee, the AMATS Citizen Advisory Committee (staffed by MOA Planning & Zoning Commission employees) and the public.¹⁹

Actions

Transportation

Public transportation in the MOA needs to be expanded in order to begin meeting goals of the Mayor’s Climate Commitment. Greater transportation options in Anchorage will be vital for the continued development and expansion of Anchorage.

- *Current public transportation actions:*

Currently PM offers a very efficient use of funds. Therefore PM should be expanded and promoted rather than designing a major new infrastructure. The PM organization recently conducted a review of all the major plans such as the Anchorage 2020, Anchorage Downtown Plan, and the 2005 Long Range Transportation Plan. From the review PM identified the following priorities areas to focus on:

Implementation and increased service on Sundays and late evening trips on weekday routes.

18 People Mover Public Transit Advisory Board. <http://www.muni.org/transit1/ptab.cfm>

19 See appendix B for AMATS Public Participation Plan. Public Review Draft. Released September 25, 2008. Also available at www.muni.org/iceimages/transplan/AMATSPPPDRAFTPrerelease-Draft.pdf

Creating 30-minute headways on all bus routes all day. Headway is the interval between two buses traveling the same direction along the same route.

Doubling service on select routes, decreasing major route headway to 15 minutes, and easing traffic on the Glenn Highway by increasing bus service.

New service priority areas include a South Anchorage Park and Ride, a Downtown Circulator, an express route connecting the Alaska Native Medical Center to downtown, as well as three new routes south of the Diamond Transit Center. New service improvements will cost approximately \$643,000 each.

- ***Short-term public transportation actions:***

Short-term actions include dramatically increasing the PM's funding by seeking more local, state, and federal funding sources. Local sources of funding include those provided in the Long Range Transportation Plan, which will be voted on by the Anchorage Assembly, transportation bonds, and other sources.

One project that needs to be implemented in the short-term is an expansion of the PM-Anchorage School District (ASD) partnership. Expanding such a partnership could encourage both ASD students and parents to use the PM system. This partnership could help reduce a public transportation stigmatism that only the poor ride the bus, and also educate our youth about the benefits of public transportation.

- ***Mid-term public transportation actions:***

The main focus of the mid-term goals in Anchorage should focus on the MOA's Public Transportation Department (PTD) and creating transportation-oriented developments (TODs).

The PTD should begin investigating both bike and car sharing programs. Bike and car sharing programs would offer the citizens of Anchorage more climate-friendly transportation and mobility options.

Bicycles and bicycle related programs must be expanded. Bicycles, bike tools, bike racks, and bike lockers should be made more available in the MOA.

In order for the MOA to encourage their employees to use alternative methods of transportation it is important for the MOA to offer emergency ride programs. The MOA should become a model

for Anchorage by offering increased employee benefits for employees who use alternative methods of transportation, such as car- and vanpooling, public transportation, or bicycling. The benefits could include increasing worker's schedule flexibility and telecommuting and virtual office programs.

The MOA could increase the availability of bicycles in the community by supporting or creating more bicycle cooperatives. Anchorage already has a successful bike cooperative, the Off-the-Chain Bicycle Cooperative, which has placed more than 50 recycled bicycles back into the Anchorage community. The mission statement of Off-the-Chain Bicycle Cooperative is "it is a low cost, volunteer run bicycle cooperative open to the Anchorage community. Off-the-Chain strives to increase bicycle rider-ship, awareness, and safety through community service and education."

- ***Long-term public transportation actions:***

The long-term goals of Anchorage should focus on the creation of a synergistic mass transportation system linking all major urban areas of Alaska including Fairbanks, Mat-Su area, the MOA, and the Kenai Peninsula. The connection of trains, streetcars, buses, and ferries could make such a network a reality.

Pedestrian facilities

Increasing the availability of pedestrian facilities is vital to improving the mobility of Anchorage's residents and visitors. Non-motorized facilities which includes sidewalks, paths, trails, roadway design and management, parking policies, taxes and fees, and traffic enforcement activities should be developed with sustainable design and carbon reduction strategies in mind.

- ***Current pedestrian facilities actions:***

Currently there are many different programs in operation to improve the transportation and mobility situation in the Anchorage municipality. The primary plan is the Non-Motorized Transportation Plan, which includes:

- The Anchorage Pedestrian Plan - finished in 2007,
- The Bicycle Plan - to be complete in 2008, and
- An update of the Area-wide Trails Plan - to be completed in 2009.

- ***Short-term pedestrian facilities actions:***

Continue support of the Anchorage Nonmotorized Transportation Plan (NMTP) which provides increased transportation and mobility options for Anchorage. If these plans are implemented Anchorage will continue to become a more pedestrian friendly city.

Assess snow-removal strategies in relation to the Non-motorized Plan goals.

- ***Mid-term pedestrian facilities actions:***

The implementation of improved snow removal strategies targeting pedestrians will be a key measure to the development of Transportation Oriented Developments (TOD). TODs are a mixed-use residential or commercial area designed to maximize access to public transport, and often incorporate features to encourage transit ridership.

There are current plans to implement heated sidewalks in downtown Anchorage, these plans need to be expanded into future TODs as well as high traffic pedestrian areas and eventually to all of the paved trails in the city.

- ***Long-term pedestrian facilities actions:***

The long-term pedestrian facilities actions should create a pedestrian friendly winter city with improved trail design, street crossings, traffic calming and management measures, bike facilities, and TODs.

Transportation efficiency

The emissions from cars, buses, trucks, and taxis accounts for much of the MOA's greenhouse gas emissions. Making the current MOA fleet more efficient can lead to major reductions in emissions in Anchorage.

- ***Current transportation efficiency actions:***

Currently the MOA owns many Compressed Natural Gas (CNG) vehicles; increased use of these vehicles should be encouraged.

- ***Short-term transportation efficiency actions:***

Develop alternate fueling infrastructure to meet the changing needs of Anchorage residents and visitors.

Increase use of hybrid, CNG, and high mileage vehicles in the MOA fleet.

Begin exploring the 'greening' of MOA's taxis using local incentive programs. Also work with taxi companies and drivers to reduce the amount of deadheading in the region. Deadheading is, for example, the drive that a PM bus takes to the start of a route with no passengers. . Reducing deadheading can reduce emissions for both taxis and buses.

- ***Mid-term transportation efficiency actions:***

The MOA can continue efficiency measures by exploring the use of more efficient Police, Fire, Rescue, and Ambulance fleets. The police department could replace current non-pursuit vehicles

with more efficient high-mileage vehicles. For the Fire, Rescue, and Ambulance fleets the city should focus on purchasing the most fuel-efficient vehicles in the future such as large turbo diesel vehicles.

- *Long-term transportation efficiency actions:*

In order for the MOA to see serious change in transportation efficiency, policy must be developed to incentivize Anchorage residents to drive alternate fuel vehicles such as electric, electric/gas hybrids, CNG, hydrogen, biodiesel, and ethanol gas mixtures.

Anchorage needs to choose to implement strategies to create and improve public transportation, pedestrian facilities, and transportation efficiency. Implementing these strategies will help the MOA meet the goals of the Mayors Climate Commitment, the 2020 Plan and other local plans, offer Anchorage residents increased mobility options, and have many other economic and health benefits.

V. WASTE MANAGEMENT

by Philip Louie ²⁰



Baled waste at Tatabanya landfill

Introduction:

Waste management, while seemingly trivial, has taken a hold of our attention as our lifestyles have become increasingly more and more intensive in terms of refuse. Many products today are individually wrapped and contain unnecessary packaging. The average American's life is one filled with convenience. We have greatly gained from these wonderful innovations in packaging and technology but our lands, our natural heritage, and our children have paid the price. Our waste has become increased exponentially in volume, complexity, and toxicity. Currently, the most prevalent solution has been to simply bury the garbage; whilst this may have worked in the dawn of society, it has not worked for quite some time as much of our waste will continue to exist for many a millennium and may even outlive our species. Awareness of this growing problem has started to change this trend into a much more sustainable and cost effective one. Entire nations, regions, cities, and even university systems have adopted aggressive policies tackling waste creation and waste management. Anchorage as a leader in Alaska and the Northwest Pacific region must tackle these dangerous and age-old problems.

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Mission Statement:

A comprehensive waste prevention and waste management strategy to preserve our beloved and incomparable Alaskan lands and waters without compromising the way of life and the connection to our wilderness that we have enjoyed and have promised to our children and future generations.

Section 1: Recycling

Objective:

The City of Anchorage should expand its recycling program and make it universal for all waste collection agencies.

Having a number of recycling plans, some with additional charges and fees, is confusing for Anchorage residents and allows companies to shirk their corporate and neighborly responsibilities. By charging a fee for a voluntary recycling program, private waste management companies create disincentives for Anchorage residents to recycle at all, forcing them to choose between either paying for a recycling plan or to opt for a larger refuse bin. Many sections of town do not offer a recycling program at all and require residents to move their recyclables at collection points. By universalizing the SWS recycling plan, residents would be able to recycle at little or no additional cost. Collection and processing would be centralized and made much more efficient through economies of scale. Increasing the number of recyclables in the Anchorage area not only encourages better waste prevention and management practices but also creates jobs locally in materials recovery and processing.

Current actions:

- MOA has recently premiered its curbside recycling pickup program and waste bins in select neighborhoods in the city of Anchorage.
 - a. The rollout of this plan has been slow and limited to a small number of areas in Anchorage.
 - b. Currently, most residents are not able to or cannot switch over to the new system and have little options in recycling.
 - i. Collection points are currently the options for most Anchorage residents.
 - ii. Other recycling plans are optional and at a cost to consumers.
- Other concerns regarding the overall waste management system is the few types of recyclable plastics in the new program. Currently, certain types of plastics are being accepted. These types are generally marked as 1 and 2.

- a. Other plastics, plastic bottle caps, glass, electronics, computers, and other recyclable material must be brought into special drop points.
- Currently, the status of recycling bags is in question and is not being accepted at the Anchorage Recycling Center.

Short Term Goals:

- Extend a universal recycling program to all areas within the city.
 - a. Companies that do not meet the criteria will be fined. Revenues from fines may be used to offset costs of the recycling program.
 - b. Expand current recycling policies to accept plastics other than those marked #1 and #2.
 - c. Use revenues from fines to make the recycling of electronics, glass, metals, and other household material easier.
 - d. Create a waste prevention and management superagency to oversee the recycling efforts and waste prevention strategies of the city and local waste management companies.

Midterm to Long Term Goals:

- Plan and build a materials recovery facility to handle the sorting and recycling of materials in Alaska.
- Transport recyclable materials along the railway during offseason to a municipality-run materials recovery center.
- Expand partnership with the University of Alaska Anchorage in running the materials recovery facility as a learning laboratory in the following fields: Process Technology, Civil Engineering, Logistics, Applied Environmental Science and Technology, and Engineering Management.

Section 2: Municipal Waste Prevention Policies

Objective:

The City of Anchorage should create and continue policies and practices that encourage the reduction of waste at the household and business level.

Local city governments have had success in creating policies and practices that encourage their residents to recycle. These policies have included economic and logistical means of reaching citywide recycling and waste reduction goals. Positive monetary incentives are difficult but possible in local governments and are accepted widely by the public. Alternative usage for reusable waste has been highly successful in island nations where space and skilled labor is limited and transportation of waste is costly. While Alaska is not an island, it experiences similar predicaments and thusly, should adopt similar strategies.

Permanent Goals:

- Create a demand fee for periods within the year where demand for refuse removal is higher than normal such as the holiday season.
 - a. Use fees to subsidize any costs of recycling and transportation of recyclable goods.
- Continuance of the offering of no costs leases of public lands for composting areas and wood lots.
 - a. Lower or eliminate usage fees for dumping organic materials at compost lots to encourage composting.
- Place fees and restrictions upon toxic plastics in retail venues.
 - a. Plastic Bag Tax
 - i. Ireland began this method of waste prevention and has found great success. Large American cities, such as New York and Seattle, have recently enacted similar measures and have begun to meet success in eliminating plastic bags.
 - b. Disposable container tax and redemption credits
 - i. By imposing a broad tax upon all disposable containers such as plastic bottles, polystyrene (Styrofoam) and other plastic food containers, paper and polystyrene coffee cups, and other disposable items, the usage of such items would be reduced and landfill lifetime would be extended. The revenues gathered from these taxes would fund the redemption values and further encourage recycling within the municipality.
- Find alternative uses for recyclable and non-recyclable materials that would otherwise be shipped out or left in the landfill.
 - a. Plastic fibers, made from shredded plastics, have been found to increase the overall, compressive and flexural strength of concrete structures. New and innovative usage of plastics in construction will not only reduce waste in land

fills, but will also greatly aid our growing city in building not just new structures but safer more sustainable structures.

- b. Create public programs to find and encourage alternative uses for refuse.
 - i. A program in Tatabanya, Hungary has found a use for plastics that could not be recycled currently and found a means to reuse them. The local children were challenged to collect only plastic bottle caps which were collected by the city. The plastic was remolded into benches and play grounds, a tangible, aesthetic, and high visible incentive. Similar programs to encourage public participation with highly visible and aesthetic public rewards would reduce our waste, create a feeling of ownership and pride amongst the public, and enhance green-spaces and bus stops.
 - c. Investigate current waste to energy technology.
 - i. Cities in the nation and across the developed world have turned to various advanced and efficient technologies to convert mixed waste into heat and energy. Plasma arc gas conversion (PAGC), gasification, and thermal depolymerization (TDP) are new processes that have been tested and are currently in use in various cities in the US, UK, Japan, and Canada. These processes have provided energy, heat, and fuel to their cities while reducing waste residuals to less than one percent or less.
- Landfill usage should be reduced to 50% by 2015, 80% by 2020 and 100% by 2025.

Section 3: Refuse-Derived Energy Alternatives

The City of Anchorage should utilize any source of energy and fuel available to generate revenue and offset costs of operations.

Cities across the United States and other nations have found success in deploying waste-to-energy technologies which can convert mixed wastes, including sewage, into usable electricity, trade-able recycle-able commodities, and useable fuels. This three-pronged approach eases problems with sanitation, waste management, and energy needs. The usage of waste as energy is a recent technology and has been proven both in the lab and in the field.

Current Actions:

- Plans for a methane-fired electrical generation plan are being finalized in preparation of building a possible facility at the regional landfill.
- Estimated costs are \$7.4 million dollars, half of which will come from Matanuska

Electric Association.

- Currently, approximately 34 million BTUs of usable methane are being burned off in the flaring mechanism.

Short Term Goals:

- Investigate other options for refuse-derived fuel and waste-to-energy techniques.
- Build methane capture system and requisite piping for future methane-based energy and fuel projects.
- Form a partnership with University of Alaska Anchorage in operating either a methane biogas production facility or methane-fired electricity generation plant as a living laboratory for the School of Engineering.

Mid to Long Term:

- Utilize current and new safe methods to expedite and increase anaerobic methane production. Much of the currently known techniques include simple solutions such as shelter, an occasional stirring, and even the addition of alkalis to increase the surface area of the waste to expedite biological processes.
- Facility compressing captured methane into useable biogas.
 - a. Utilize biogas to power waste management vehicle fleet.
- Install high waste-to-energy facility that disposes of waste by converting it to usable refuse-derived fuels, usable recycled commodities, and energy.

VI. COMMUNITY OUTREACH AND EDUCATION

Renata Ballesteros-Lopez ²¹



Sod House, Sommaroy, Norway

Educating and involving Anchorage's population is also an important aspect towards fulfilling the goals in this climate action plan. Millions of dollars, energy watts, and carbon emissions can be saved through the mere modification of citizen's habits, attitudes, and lifestyles; therefore every Anchorage inhabitant can and should cooperate with this cause.

Nonetheless, many people do not yet know how to contribute to the development of sustainability in the community. So far, local environmental organizations have been in charge of educating the public through campaigns, fairs, and lectures at Anchorage's schools. Their efforts would be significantly more powerful if the MOA became the main leader and supporter of public environmental education.

There are three major sections of the population in which outreach and education would have the most lasting and noteworthy effect. The first area would be the Anchorage School District, for basic education is often the most important factor in a motivated and well-informed population.

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The second focus area should be the general public, and the third area should be different groups of professionals who play essential roles in the city's development (e.g. engineers, contractors, city employees, educators, etc). These groups would foster Anchorage's sustainable efficiency further by receiving specialized education and training.

Mission Statement:

The entire population of Anchorage will have a genuine concern for environmental practices and will be well informed about them through academic learning and media communication. On the other hand, specialists in the Municipality's constructive and educational development will have up-to-date information and resources available to them as well as appropriate training.

Relevant Actors

The main entities in Anchorage that play major roles in public education are:

1. The Anchorage School District (ASD) - ASD is the main educational entity in the municipality and Anchorage's best asset to enforce sustainability teachings among Anchorage's youth.
2. Alaska Youth for Environmental Action (AYEA) - A high school environmental education and leadership program of the National Wildlife Federation.²²
3. Alaska Center for the Environment (ACE) - ACE is a non-profit, environmental organization that foments ecological awareness in the community. They count with more than 7,000 members from around the state.²³
4. ALPAR (Alaskans for Litter Prevention and Recycling) - "A privately funded, non-profit organization dedicated to eliminating litter and increasing recycling in Alaska."²⁴
5. Green star - An Anchorage-based non-profit organization that encourages waste reduction, energy conservation and pollution prevention among businesses and schools. It provides them with education, assistance, grants and certification programs.²⁵

22 (November 13,2008). *About AYEА*. Alaska Youth for Environmental Action. Retrieved November 18, 2008, from <http://www.ayea.org/aboutus.html>

23 (2008). *About us*. Alaska Center for the Environment. Retrieved November 18, 2008, from <http://www.akcenter.org/about>

24 (June 10, 2008). *Alaskans for Litter prevention and Recycling*. Retrieved November 18, 2008, from <http://www.alparalaska.com/>

25 *Green star- good for business- good for the community- good for the environment*. Retrieved November 18, 2008, from <http://www.greenstarinc.org/>

6. Global Learning and Observations to Benefit the Environment (GLOBE) - “ A world wide hands-on, primary and secondary school-based science and education program. GLOBE’s vision promotes and supports students, teachers and scientists to collaborate on inquiry-based investigations of the environment.”²⁶ The University of Alaska Fairbanks GLOBE franchise was created on 1996. Since then, the Alaska GLOBE program has grown to include 88 classroom teachers in 62 schools around Alaska.²⁷
7. Alaska Housing Finance Corporation (AHFC) - This corporation is in charge of various programs meant to improve the housing quality in Alaska. They currently manage a weatherization and energy-efficiency grant program and carrying out research projects with the Cold Climate Housing Research Center.²⁸
8. University of Alaska Anchorage (UAA) and Alaska Pacific University (APU)

Objective for Municipal Schools: *The Municipality of Anchorage should ensure that all the student population of the Anchorage School District well-versed on green practices at school and at home, giving them life-long habits that will promote a cleaner city.*

Current actions

- The ASD launched a mixed-paper recycling program in all schools and facilities with the help of the MOA, Solid Waste Services, Alaska Waste, and Green Star. This program’s goal is to have every school in Anchorage recycling mixed-paper by the end of the 2008-2009 school year. At the end of the year, the program will be evaluated and inclusion of other recyclable materials will be considered. Teachers are encouraged to show the importance of recycling to their students by asking for their cooperation. (A. Kirn-Leist, personal communication, November 4, 2008).
- Students have created sustainability clubs and other kinds of student organizations within the schools to create an environmental conscience in their schools and foment peer to peer environmental education.
- ALPAR has provided posters to schools to help remind kids manage waste properly.
- AYEА and ACE have done an excellent job educating the Alaskan youth on various environmental issues through workshops and trainings at local schools on environmental

26 (August 30, 2006). *The Globe Program*. Retrieved November 18, 2008, from <http://www.cgc.uaf.edu/Globe/default.html>

27 University of Alaska Fairbanks Globe Franchise. *Alaska Globe Program*. Retrieved November 18, 2008, from <http://www.cgc.uaf.edu/Globe/akglobe.html>

28 *About Alaska Housing Finance Corporation*. Retrieved November 18, 2008, from <http://www.ahfc.state.ak.us/about/about.cfm>

leadership and civic engagement. Furthermore, they organize annual summer camps and other events for the youth in Anchorage.

Short-term Objectives

- Introduce teachings about energy saving at home, managing waste, and general environmental ethics in the curriculum of some school grades.
- Provide support, organization, and leadership for the local organizations with their ongoing education campaigns through funds, staff, or resources.

Mid-term Objectives

- Make field trips and presentation about sustainability and green practices regular parts of the school year in all grades. These trips could include public showings of wind-farms, hydro-electric plants, or other infrastructure that contributes to the greening of the city.
- Create more events that encourage sustainable leadership in schools and increase the student's interest.

Long-term Objectives

- Make topics related to sustainability a permanent part of the curricula in all education levels and facilities of the ASD.

Objective for the General Public: *The Municipality of Anchorage should make an effort to integrate sustainability and environmental concern into Anchorage's culture, as well as becoming a leader of sustainability through action and example.*

Current Actions

- The MOA has launched various campaigns to create a more environmentally conscious community such as the "Bike to Work Day," "Adopt a Park," etc. It has also worked with ALPAR and other organizations and businesses to promote the new curbside recycling service through public awareness programs.
- ALPAR, ACE, AYE, and Green star, among many other environmental organizations, print and distribute newsletters, brochures, and pamphlets among their members and the general public. They also organize regular
- UAA and APU have hosted sustainability fairs, conferences, and workshops open to the public.

Short-term Objectives

- Launch an ongoing campaign that includes the school district, local environmental organizations, and massive communication media. This covers various aspects of sustainability and reaches the public through different approaches. This campaign can teach simple tips the public can do to protect the environment, e.g. from recycling, to using less hot water. Some possible topics that the campaign could cover are listed below:
 - Driving less, using public transportation, walking, or carpooling.
 - Saving energy and water at home
 - Managing waste
 - Using and protecting green areas
 - Building a community and showing the advantages of density
- Make the publications released by ALPAR, AYE, ACE, and other organizations available in more public facilities; for example, in busses and bus stations, in schools, in government offices, etc.
- Expand the MOA's webpage to contain an easy-access and regularly updated section concerning sustainability in Anchorage for public interest. It should include links to the internet sites of other of the main organizations in town.

Mid-term Objectives

- Coordinate with the media, schools, local universities, and organizations to inform the population better about environmental outreach events taking place in town.
- Conduct surveys to see the general response to media campaigns and make necessary changes to include people's attention

Long-term Objectives

- Renew media campaigns according to the popular response. Modify them as new needs or challenges arise.

Objective for the Target Groups: *The Municipality of Anchorage should support the education of the key groups that will influence the sustainable development of the community.*

Current Actions

GLOBE has been providing presentations, workshops and trainings on environmental pedagogical strategies for teachers in Alaska since 1996.

- AHFC, the Department of Neighborhoods and the U.S. Department of Energy support the weatherization program in Anchorage’s residences and provide training for weatherizing technicians.

Short-term Objectives

- Intensify the teachers of the Anchorage School District’s training on how to teach sustainability to their students through the GLOBE and other trainings on environmental sustainability.
- Support the programs that foment green jobs in the community. For example, support for organizations that teach green building and weatherization in companies, technical schools, and universities that teach building technology and engineering.
- Continue the training of federal employees that encourages energy-saving practices in the work place.

Mid-term/Long-term Objectives

- Work with the local universities, businesses and training companies to help contractors, architects, electricians, et al share information regarding the latest environmentally-friendly technologies, practices, and building codes.



Tatabánya, Hungary used to be the mining capital of Hungary. The symbol depicts a closed mine (the hammers are upside down).

Concluding Comments.

It is with great pleasure that the six students involved with this project, and their faculty supervisors, present this Climate Change Action Plan to the University of Alaska Anchorage and the Municipality of Anchorage. We hope that the efforts and information contained herein contribute to a more sustainable, productive, and healthy future for the residents of our community and our state.

