PRELIMINARY REPORT

TO THE ALASKA STATE LEGISLATURE

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5.3 Planning and Infrastructure

Introduction

A full analysis of Planning and Infrastructure requires a collection and review of cross-border, national, state, regional and community economic development plans, transportation plans, and strategic planning documents.[14] The goal should be to identify ways in which multiple levels of planning are integrated and coordinated to support economic and community development, and response operations, in the Alaskan Arctic. Planning and Infrastructure should accommodate:

- Ports, Harbors, Places of Refuge, and Anchorages
- Telecommunications, Aids to Navigation, and Data Acquisition and Sharing
- Emergency Management and Response
- Transportation and Access to Resources
- Energy Extraction, Production and Delivery
- Human Resources, Workforce Development, Research, Education and Training
- Sewer and Water

Critical to our understanding of these areas is the extent to which they are inter-linked as fundamental building blocks of sustainable development in the Alaskan Arctic. The vast majority of work to date in these areas has been intermittent (conducted on a project by project basis), uncoordinated (unresponsive to a direct point of contact or leadership team) and independent (unable to take into account inter-modal and cross-sector assets or processes). In order to ensure future prosperity in the Arctic, Alaska must implement strategic, integrated, and intentional planning that results in safe, secure, affordable, efficient, and reliable activities.

Background[15]

When considering planning and infrastructure in the Alaskan Arctic, it is important to understand the scope of the region, its resources and broader issues of concern. The coastline from Dutch Harbor in the Aleutians to Barrow on the North Slope is the same distance as the coastline from Maine to the southern tip of Florida. Within the Alaskan Arctic, there is a vast array of resources.

2012 saw the lowest level of summer sea ice, covering only 3.4 million square kilometers. Sea ice recovered somewhat in 2013, however the overall trend is decreasing sea ice at an aerial extent of 2.7% per decade and accelerating. Predictions are wide-ranging, but there could be a completely ice-free Arctic ocean (in summer months) as early as the 2030's. As ice melts, shipping though the Arctic will increase. Businesses can reduce shipping costs by as much as 40% using Arctic routes rather than the Suez Canal. While this is still not (and may not ever be) a major shipping route, there is increasing activity – mainly along the Northern Sea Route (along

[14] See PandI Appendix C Reference list
[15] Adapted from the Alaska Northern Waters Task Force final report, which continues to be relevant

Russia's northern coast) and through the Bering Strait. According to the U.S. Committee on the Marine Transportation System, a record 46 vessels transited the Northern Sea Route in 2012 compared to 36 in 2011 and 4 in 2010. According to Russian officials, 71 vessels transited the NSR in 2013.[16] In 2012, 1.2 million tons of cargo, up 50% from 2011, was shipped through the Northern Sea Route. In Alaska, and specifically the Bering Sea, vessel traffic is also increasing. Between 2008 and 2012, vessel transits in the Bering Sea rose from 220 to 480. On top of minimal communication equipment, poor weather forecasts, and poor sea ice predictions, the nearest emergency response facilities are located in Anchorage, Kodiak and Dutch Harbor, which are at least 635 miles away from the maritime Arctic Circle. There is a critical need to improve infrastructure along the coast to support search-and-rescue efforts and oil spill response to keep up with additional marine traffic and other human activity.

Clearly, the Arctic is experiencing profound change as it is confronted with the increasingly evident forces of globalization and climate change, as well as new economic challenges for its communities. But this area is not new to the world. Indigenous peoples have been living in the Arctic for thousands of years. It is home to many Alaska Native cultures that rely on subsistence hunting and fishing. It is also an area of heightened environmental importance. Even in a region that is characterized by harsh climates, extreme weather conditions, and times of constant light followed by constant darkness, there is an abundance of life.

Increasing changes and activity in the Alaskan Arctic are likely to hold enormous implications for both existing and future construction of infrastructure. The ability to better predict and understand the effects of phenomena such as widespread thawing of permafrost will help Alaska prepare for considerable maintenance issues on existing roads, airports, buildings, and pipelines. Just as importantly, it will aid engineers when it comes to properly siting, designing, and constructing new infrastructure capable of withstanding future changes in their specific environments. The Alaska Department of Transportation and Public Facilities (ADOTPF) have also examined these important concerns in their report on the "Impact of Climate Change on Alaska's Transportation Infrastructure."[17]

These changes pose significant challenges to some communities in Arctic coastal and riverine areas, most notably those located along the Bering and Chukchi Seas. A number of communities are threatened with increased rates of coastal erosion and flooding as a result of storm activity and battered shorelines once protected by shore-fast ice. These problems could become chronic as the climate warms, seasonal sea ice retreats, and destructive coastal storms become more frequent. These important concerns have been recognized in reports issued by the state of Alaska's Climate Change Subcabinet Immediate Action and Adaptation work groups.

[16] See reference, http://news.nationalgeographic.com/news/energy/2013/11/131129-arctic-shipping-soars-led-by-russia/
[17] See reference, http://climate.dot.gov/documents/workshop1002/smith.pdf

Immediate investment in Arctic infrastructure is a priority for Alaska and is relevant to the interests of the entire United States. Alaska will need to explore ways to attract substantial sources of capital investment in addition to state and federal funding. Action is needed to enable the responsible development of resources; facilitate, secure, and benefit from new global transportation routes; and safeguard Arctic residents and ecosystems. This investment will improve the safety, security, and reliability of transportation in the region—a goal established by the U.S. Arctic Policy signed by President Bush in 2009 and included in the 2013 U.S. National Strategy for the Arctic Region.

Over the last 50 years, the state (through the Village Safe Water program within the Alaska Department of Environmental Conservation) and its federal funding partners (EPA, USDA Rural Development and Indian Health Service) have supported community sanitation systems in rural Alaska. However, DEC reports that the cost of addressing rural sanitation needs has increased substantially in recent years while annual funding has decreased substantially. If this long-term trend continues, many rural Alaska homes will never receive adequate water and sewer service, and many others will lose service as resources will be insufficient to replace all aging infrastructure.

With transformation in the Arctic calling for a broad spectrum of new facilities on such a large scale, the state of Alaska must take an active role in regional planning efforts with communities and their stakeholders, while also keeping in mind the maintenance and upkeep of existing infrastructure. This will help communities develop local strategies and ensure that the state is getting the most return on investment for local projects. Some communities may not have the resources to adequately prepare for the future, and the state should take this opportunity to help increase local capacity for the benefit of all Alaskans.

Discussion and Considerations

Alaska is on a cusp; declining oil production and the reliance on that revenue stream have minimized the development of other resources and the infrastructure necessary for that development. Regardless of whether the development is of oil, gas, methane gas hydrates, minerals, geothermal, other renewable resources or the development of transportation capabilities, a new focus on the development of a statewide *infrastructure system* is necessary and timely. Regionalizing such a system – and beginning with emerging challenges and future scenarios in the Arctic – allows planning to take place that recognizes local and community concerns, prioritizes local resources differently, and provides the greatest leverage to address localized challenges and the greatest amount of opportunity. Infrastructure contributes to *economic growth* (acting through both supply and demand) as well as a peoples' quality of life.

The state of Alaska, then, should consider as a fundamental aspect of its Arctic policy the active development of Arctic infrastructure.[18] Indeed, a robust Arctic infrastructure system is the best answer to economic development planning. This will require the state to make public infrastructure investment decisions based on three components: good economic practices ensuring financial stability; minimizing the impact on the land ensuring environmental sustainability; and assuring the impact on the peoples of Alaska is always positive.

The primary concern should be the meaningful evaluation of – and investment in – response capacity. Alaska must take a leadership role in its emergency management systems in order to reduce uncertainty. A tiered approach whereby Alaska is able to identify primary, secondary and tertiary response assets is warranted. Included in the mix should be consideration of private and/or industry-owned assets, which may be closer to an impacted area than public resources.

Increasing attention should be paid to communications and navigational aids, as well as mapping, hydrography, and bathymetry. The state of Alaska can facilitate this to a large extent, working with federal partners and industry. The same is true for data sharing, increased research collaboration, and private-public partnerships in acquisition and value-added products.

It is worth recognizing that differences in proximity, risk, geography, and scale of challenge make evaluation of response capacity and the need for infrastructure difficult—there is not a one-size-fits-all approach to infrastructure development.

Infrastructure development must be responsive to social, environmental and cultural impacts as a core element of sustainable development. This is important not only for transportation infrastructure, but for energy development and transmission. Furthermore, accessibility of high speed internet in rural communities is still a major obstacle for participation in decision making and is needed to foster more innovation for sustainable businesses in rural villages, and to inspire the state's young people to return after college.

Creative funding strategies (i.e., public-private partnerships) for infrastructure cannot be ignored. Much of the critical infrastructure throughout the North is under the same influences of time, climate change and dwindling resources – planning should occur accordingly. At the same time, investments in infrastructure should be leveraged—an intermodal approach and layering of resources has a multiplier effect on infrastructure development and a direct impact on economic and community development. In addition, planning and infrastructure development needs to account for global supply chains and staging infrastructure outside Alaska.

Lack of adequate water and sewer service is posing a serious health risk in a number of communities in rural Alaska including in the Arctic. Residents without running water and flush toilets have a significantly higher incidence of serious infection than persons with sanitation

[18] See Appendix A "Alaska Northern Waters Task Force" - Findings and Recommendations Pg. 18

service. Approximately 4,500 households in rural Alaska lack running water and flush toilets and many of the 30,000 homes currently connected to systems are in jeopardy of losing service due to system age, deterioration, and harsh weather conditions.

Finally, Alaska's greatest resource is its people, who should be prepared to compete beyond the state for opportunities around the world. Only in this way can Alaska ensure its competitiveness. Adequate funding for education from pre-kindergarten through college will be necessary, as well as investment in technical trainings.

Conclusion: Policy Recommendations

Strategic Recommendations

- Conduct a comprehensive Arctic region economic and infrastructure assessment and planning process that integrates local, regional, state and federal planning efforts.
- Encourage the development of an inter-agency and inter-governmental working group tasked with working with multiple levels of stakeholders to develop and implement a prioritization, funding and implementation mechanism for constructing and maintaining infrastructure and economic development.

Other Recommendations

1. Sub-area plans have identified response sites but there is not enough funding to place container vans for all sites. Additionally, current planning does not identify public and private or industry-owned assets. Local communities are not up to date with National Incident Management System/Incident Command System (NIMS/ICS) nor are first responders trained in HAZWOPER, etc.

   A. The state of Alaska should work with industry to identify and develop primary, secondary and tertiary response infrastructure (and corresponding equipment) and train and sustain first responders.

   B. The state of Alaska should recognize that local contingency plans listing assets must be included in the Sub-area plans.

2. In federal waters the U.S. Coast Guard is in charge of navigational aids; NOAA and the U.S. Army Corps of Engineers are charged with mapping and bathymetry; and the Alaska Department of Natural Resources (DNR) is responsible for this in state lands. The private sector is also collecting data on leased areas.

   A. The state of Alaska should support, invest in and complete increased communications and navigational infrastructure, mapping, hydrographic and bathymetry with data shared using collaborative research and private-public partnerships.

B. The state of Alaska should coordinate with internal and external agencies and gather private sector data for completion of mapping, hydrographic and bathymetry data sharing.

3. Each region or community has their own separate plans for infrastructure development, but these plans are not incorporated into a holistic Alaska Arctic plan. Infrastructure development should be responsive to social, environmental and cultural impacts and that intermodal infrastructure should benefit economic and community development.

   A. The state of Alaska should initiate a comprehensive Arctic region economic and infrastructure assessment and plan.

   B. The state of Alaska should include in such a plan criteria (that identifies proximity, risk, geography and scale of challenge to include intermodal infrastructure) from which projects could be prioritized.

4. The state is operating under a banner of fiscal constraint – state, federal and local budgets are dwindling – while the vast majority of (and increasing) infrastructure projects are in the millions of dollars.

   A. The state of Alaska should establish infrastructure funding mechanisms for multiple infrastructure projects and should include incentives for cross-project planning and for public-private partnerships.

5. The Alaskan Arctic's hub communities have regional training facilities. Some programs are for high school students only or for adults only.

   A. The state of Alaska should create additional programs for adults and students in vocational training.

   B. The state of Alaska should develop Arctic workforce development and education opportunities for Alaska's workforce, to include ice navigation, marine mammal observation, spill response, SAR, pilotage, and engineering.

6. The state and federal governments should continue to work together to assure reliable delivery of adequate water and sewer service in all Alaska Arctic communities.

   A. Alaska should work with interested parties within the United States and other Arctic nations to investigate alternative approaches that are less costly to build, operate and maintain in small Arctic communities.

   B. Alaska should continue to encourage the U.S. Department of State to include fostering new technological approaches for in-home water and sewer infrastructure as part of the agenda for the U.S. chairmanship of the Arctic Council in 2015-17.