



**PRELIMINARY REPORT**

**TO THE ALASKA STATE LEGISLATURE**

**SUBMITTED JANUARY 30, 2014**

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960 ***5.3 Planning and Infrastructure***

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961 ***Introduction***

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

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

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

981 ***Background***<sup>15</sup>

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

986 2012 saw the lowest level of summer sea ice, covering only 3.4 million square kilometers. Sea  
987 ice recovered somewhat in 2013, however the overall trend is decreasing sea ice at an aerial  
988 extent of 2.7% per decade and accelerating. Predictions are wide-ranging, but there could be a  
989 completely ice-free Arctic ocean (in summer months) as early as the 2030's. As ice melts,  
990 shipping though the Arctic will increase. Businesses can reduce shipping costs by as much as  
991 40% using Arctic routes rather than the Suez Canal. While this is still not (and may not ever be)  
992 a major shipping route, there is increasing activity – mainly along the Northern Sea Route (along

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<sup>14</sup> See PandI Appendix C Reference list

<sup>15</sup> Adapted from the Alaska Northern Waters Task Force final report, which continues to be relevant

993 Russia's northern coast) and through the Bering Strait. According to the U.S. Committee on the  
 994 Marine Transportation System, a record 46 vessels transited the Northern Sea Route in 2012  
 995 compared to 36 in 2011 and 4 in 2010. According to Russian officials, 71 vessels transited the  
 996 NSR in 2013.<sup>16</sup> In 2012, 1.2 million tons of cargo, up 50% from 2011, was shipped through the  
 997 Northern Sea Route. In Alaska, and specifically the Bering Sea, vessel traffic is also increasing.  
 998 Between 2008 and 2012, vessel transits in the Bering Sea rose from 220 to 480. On top of  
 999 minimal communication equipment, poor weather forecasts, and poor sea ice predictions, the  
 1000 nearest emergency response facilities are located in Anchorage, Kodiak and Dutch Harbor,  
 1001 which are at least 635 miles away from the maritime Arctic Circle. There is a critical need to  
 1002 improve infrastructure along the coast to support search-and-rescue efforts and oil spill response  
 1003 to keep up with additional marine traffic and other human activity.

1004 Clearly, the Arctic is experiencing profound change as it is confronted with the increasingly  
 1005 evident forces of globalization and climate change, as well as new economic challenges for its  
 1006 communities. But this area is not new to the world. Indigenous peoples have been living in the  
 1007 Arctic for thousands of years. It is home to many Alaska Native cultures that rely on subsistence  
 1008 hunting and fishing. It is also an area of heightened environmental importance. Even in a region  
 1009 that is characterized by harsh climates, extreme weather conditions, and times of constant light  
 1010 followed by constant darkness, there is an abundance of life.

1011 Increasing changes and activity in the Alaskan Arctic are likely to hold enormous implications  
 1012 for both existing and future construction of infrastructure. The ability to better predict and  
 1013 understand the effects of phenomena such as widespread thawing of permafrost will help Alaska  
 1014 prepare for considerable maintenance issues on existing roads, airports, buildings, and pipelines.  
 1015 Just as importantly, it will aid engineers when it comes to properly siting, designing, and  
 1016 constructing new infrastructure capable of withstanding future changes in their specific  
 1017 environments. The Alaska Department of Transportation and Public Facilities (ADOTPF) have  
 1018 also examined these important concerns in their report on the "Impact of Climate Change on  
 1019 Alaska's Transportation Infrastructure."<sup>17</sup>

1020 These changes pose significant challenges to some communities in Arctic coastal and riverine  
 1021 areas, most notably those located along the Bering and Chukchi Seas. A number of communities  
 1022 are threatened with increased rates of coastal erosion and flooding as a result of storm activity  
 1023 and battered shorelines once protected by shore-fast ice. These problems could become chronic  
 1024 as the climate warms, seasonal sea ice retreats, and destructive coastal storms become more  
 1025 frequent. These important concerns have been recognized in reports issued by the state of  
 1026 Alaska's Climate Change Subcabinet Immediate Action and Adaptation work groups.

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<sup>16</sup> See reference, <http://news.nationalgeographic.com/news/energy/2013/11/131129-arctic-shipping-soars-led-by-russia/>

<sup>17</sup> See reference, <http://climate.dot.gov/documents/workshop1002/smith.pdf>

## Planning and Infrastructure

1027 Immediate investment in Arctic infrastructure is a priority for Alaska and is relevant to the  
1028 interests of the entire United States. Alaska will need to explore ways to attract substantial  
1029 sources of capital investment in addition to state and federal funding. Action is needed to enable  
1030 the responsible development of resources; facilitate, secure, and benefit from new global  
1031 transportation routes; and safeguard Arctic residents and ecosystems. This investment will  
1032 improve the safety, security, and reliability of transportation in the region—a goal established by  
1033 the U.S. Arctic Policy signed by President Bush in 2009 and included in the 2013 U.S. National  
1034 Strategy for the Arctic Region.

1035 Over the last 50 years, the state (through the Village Safe Water program within the Alaska  
1036 Department of Environmental Conservation) and its federal funding partners (EPA, USDA Rural  
1037 Development and Indian Health Service) have supported community sanitation systems in rural  
1038 Alaska. However, DEC reports that the cost of addressing rural sanitation needs has increased  
1039 substantially in recent years while annual funding has decreased substantially. If this long-term  
1040 trend continues, many rural Alaska homes will never receive adequate water and sewer service,  
1041 and many others will lose service as resources will be insufficient to replace all aging  
1042 infrastructure.

1043 With transformation in the Arctic calling for a broad spectrum of new facilities on such a large  
1044 scale, the state of Alaska must take an active role in regional planning efforts with communities  
1045 and their stakeholders, while also keeping in mind the maintenance and upkeep of existing  
1046 infrastructure. This will help communities develop local strategies and ensure that the state is  
1047 getting the most return on investment for local projects. Some communities may not have the  
1048 resources to adequately prepare for the future, and the state should take this opportunity to help  
1049 increase local capacity for the benefit of all Alaskans.

### 1050 *Discussion and Considerations*

1051 Alaska is on a cusp; declining oil production and the reliance on that revenue stream have  
1052 minimized the development of other resources and the infrastructure necessary for that  
1053 development. Regardless of whether the development is of oil, gas, methane gas hydrates,  
1054 minerals, geothermal, other renewable resources or the development of transportation  
1055 capabilities, a new focus on the development of a statewide *infrastructure system* is necessary  
1056 and timely. Regionalizing such a system – and beginning with emerging challenges and future  
1057 scenarios in the Arctic – allows planning to take place that recognizes local and community  
1058 concerns, prioritizes local resources differently, and provides the greatest leverage to address  
1059 localized challenges and the greatest amount of opportunity. Infrastructure contributes to  
1060 *economic growth* (acting through both supply and demand) as well as a peoples' quality of life.

1061 The state of Alaska, then, should consider as a fundamental aspect of its Arctic policy the active  
 1062 development of Arctic infrastructure.<sup>18</sup> Indeed, a robust Arctic infrastructure system is the best  
 1063 answer to economic development planning. This will require the state to make public  
 1064 infrastructure investment decisions based on three components: good economic practices  
 1065 ensuring financial stability; minimizing the impact on the land ensuring environmental  
 1066 sustainability; and assuring the impact on the peoples of Alaska is always positive.

1067 The primary concern should be the meaningful evaluation of – and investment in – response  
 1068 capacity. Alaska must take a leadership role in its emergency management systems in order to  
 1069 reduce uncertainty. A tiered approach whereby Alaska is able to identify primary, secondary and  
 1070 tertiary response assets is warranted. Included in the mix should be consideration of private  
 1071 and/or industry-owned assets, which may be closer to an impacted area than public resources.

1072 Increasing attention should be paid to communications and navigational aids, as well as  
 1073 mapping, hydrography, and bathymetry. The state of Alaska can facilitate this to a large extent,  
 1074 working with federal partners and industry. The same is true for data sharing, increased research  
 1075 collaboration, and private-public partnerships in acquisition and value-added products.

1076 It is worth recognizing that differences in proximity, risk, geography, and scale of challenge  
 1077 make evaluation of response capacity and the need for infrastructure difficult—there is not a one-  
 1078 size-fits-all approach to infrastructure development.

1079 Infrastructure development must be responsive to social, environmental and cultural impacts as a  
 1080 core element of sustainable development. This is important not only for transportation  
 1081 infrastructure, but for energy development and transmission. Furthermore, accessibility of high  
 1082 speed internet in rural communities is still a major obstacle for participation in decision making  
 1083 and is needed to foster more innovation for sustainable businesses in rural villages, and to inspire  
 1084 the state's young people to return after college.

1085 Creative funding strategies (i.e., public-private partnerships) for infrastructure cannot be ignored.  
 1086 Much of the critical infrastructure throughout the North is under the same influences of time,  
 1087 climate change and dwindling resources – planning should occur accordingly. At the same time,  
 1088 investments in infrastructure should be leveraged—an intermodal approach and layering of  
 1089 resources has a multiplier effect on infrastructure development and a direct impact on economic  
 1090 and community development. In addition, planning and infrastructure development needs to  
 1091 account for global supply chains and staging infrastructure outside Alaska.

1092 Lack of adequate water and sewer service is posing a serious health risk in a number of  
 1093 communities in rural Alaska including in the Arctic. Residents without running water and flush  
 1094 toilets have a significantly higher incidence of serious infection than persons with sanitation

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<sup>18</sup> See Appendix A “Alaska Northern Waters Task Force” - Findings and Recommendations Pg. 18

## Planning and Infrastructure

1095 service. Approximately 4,500 households in rural Alaska lack running water and flush toilets and  
1096 many of the 30,000 homes currently connected to systems are in jeopardy of losing service due  
1097 to system age, deterioration, and harsh weather conditions.

1098 Finally, Alaska's greatest resource is its people, who should be prepared to compete beyond the  
1099 state for opportunities around the world. Only in this way can Alaska ensure its competitiveness.  
1100 Adequate funding for education from pre-kindergarten through college will be necessary, as well  
1101 as investment in technical trainings.

### 1102 *Conclusion: Policy Recommendations*

#### 1103 Strategic Recommendations

- 1104 • Conduct a comprehensive Arctic region economic and infrastructure assessment and  
1105 planning process that integrates local, regional, state and federal planning efforts.
- 1106 • Encourage the development of an inter-agency and inter-governmental working group  
1107 tasked with working with multiple levels of stakeholders to develop and implement a  
1108 prioritization, funding and implementation mechanism for constructing and maintaining  
1109 infrastructure and economic development.

#### 1110 Other Recommendations

- 1111 1. Sub-area plans have identified response sites but there is not enough funding to place  
1112 container vans for all sites. Additionally, current planning does not identify public and  
1113 private or industry-owned assets. Local communities are not up to date with National  
1114 Incident Management System/Incident Command System (NIMS/ICS) nor are first  
1115 responders trained in HAZWOPER, etc.
  - 1116 A. The state of Alaska should work with industry to identify and develop primary,  
1117 secondary and tertiary response infrastructure (and corresponding equipment) and  
1118 train and sustain first responders.
  - 1119 B. The state of Alaska should recognize that local contingency plans listing assets must  
1120 be included in the Sub-area plans.
- 1121 2. In federal waters the U.S. Coast Guard is in charge of navigational aids; NOAA and the  
1122 U.S. Army Corps of Engineers are charged with mapping and bathymetry; and the Alaska  
1123 Department of Natural Resources (DNR) is responsible for this in state lands. The private  
1124 sector is also collecting data on leased areas.
  - 1125 A. The state of Alaska should support, invest in and complete increased communications  
1126 and navigational infrastructure, mapping, hydrographic and bathymetry with data  
1127 shared using collaborative research and private-public partnerships.



- 1128 B. The state of Alaska should coordinate with internal and external agencies and gather  
1129 private sector data for completion of mapping, hydrographic and bathymetry data  
1130 sharing.
- 1131 3. Each region or community has their own separate plans for infrastructure development,  
1132 but these plans are not incorporated into a holistic Alaska Arctic plan. Infrastructure  
1133 development should be responsive to social, environmental and cultural impacts and that  
1134 intermodal infrastructure should benefit economic and community development.
- 1135 A. The state of Alaska should initiate a comprehensive Arctic region economic and  
1136 infrastructure assessment and plan.
- 1137 B. The state of Alaska should include in such a plan criteria (that identifies proximity,  
1138 risk, geography and scale of challenge to include intermodal infrastructure) from  
1139 which projects could be prioritized.
- 1140 4. The state is operating under a banner of fiscal constraint – state, federal and local budgets  
1141 are dwindling – while the vast majority of (and increasing) infrastructure projects are in  
1142 the millions of dollars.
- 1143 A. The state of Alaska should establish infrastructure funding mechanisms for multiple  
1144 infrastructure projects and should include incentives for cross-project planning and  
1145 for public-private partnerships.
- 1146 5. The Alaskan Arctic's hub communities have regional training facilities. Some programs  
1147 are for high school students only or for adults only.
- 1148 A. The state of Alaska should create additional programs for adults and students in  
1149 vocational training.
- 1150 B. The state of Alaska should develop Arctic workforce development and education  
1151 opportunities for Alaska's workforce, to include ice navigation, marine mammal  
1152 observation, spill response, SAR, pilotage, and engineering.
- 1153 6. The state and federal governments should continue to work together to assure reliable  
1154 delivery of adequate water and sewer service in all Alaska Arctic communities.
- 1155 A. Alaska should work with interested parties within the United States and other Arctic  
1156 nations to investigate alternative approaches that are less costly to build, operate and  
1157 maintain in small Arctic communities.
- 1158 B. Alaska should continue to encourage the U.S. Department of State to include  
1159 fostering new technological approaches for in-home water and sewer infrastructure as  
1160 part of the agenda for the U.S. chairmanship of the Arctic Council in 2015-17.
- 1161