

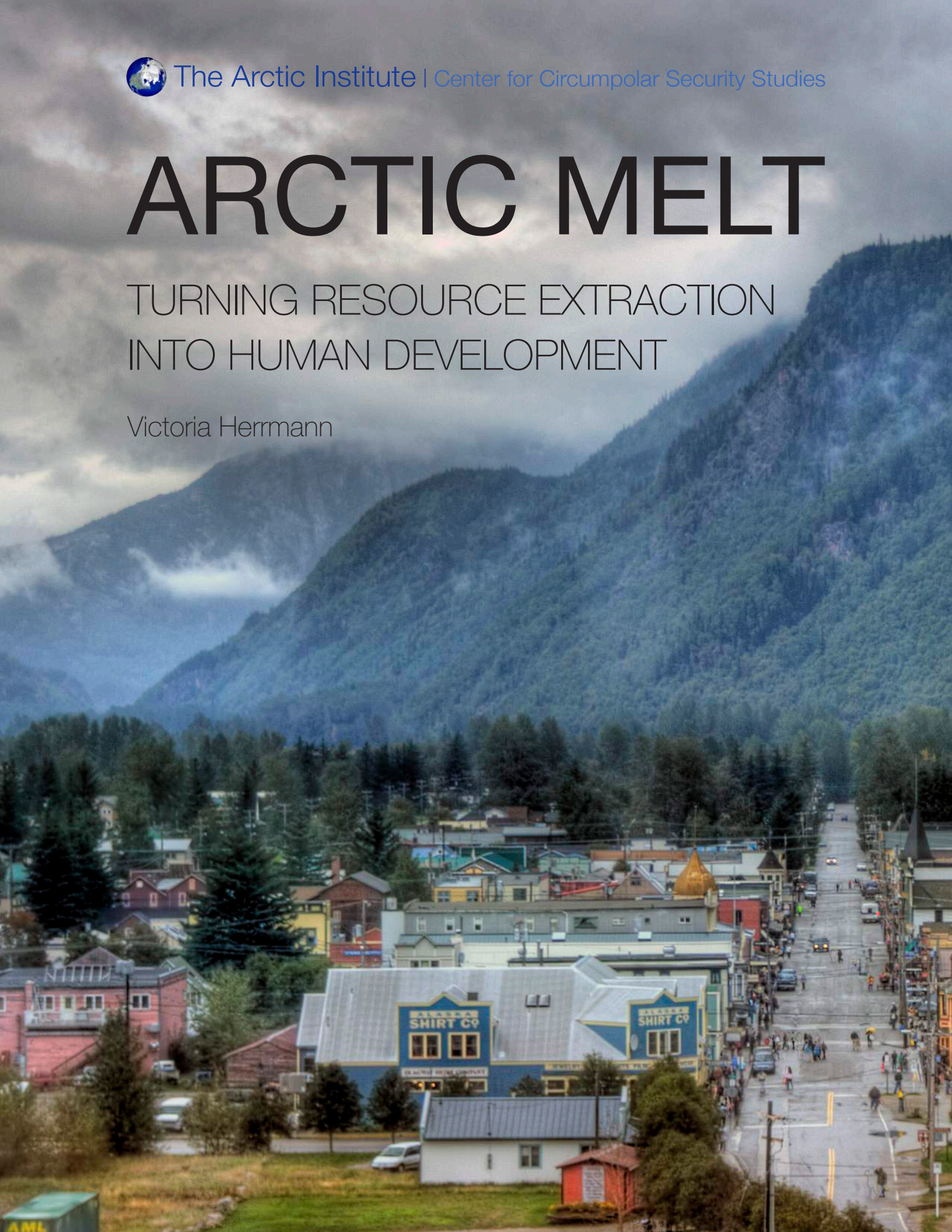


The Arctic Institute | Center for Circumpolar Security Studies

ARCTIC MELT

TURNING RESOURCE EXTRACTION
INTO HUMAN DEVELOPMENT

Victoria Hermann



The Arctic Institute | Center for Circumpolar Security Studies

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The Arctic Institute | Center for Circumpolar Security Studies
P.O. Box 32175
Washington, DC 20007

+1.202.656.6258
www.thearcticinstitute.org
info@thearcticinstitute.org

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Victoria Herrmann

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ABOUT THE AUTHOR

Victoria Herrmann is currently a Gates Scholar and PhD student at the Scott Polar Research Institute at the University of Cambridge. Her research focuses on how images and aesthetic codes construct values, identities, and ideas of power in the Arctic. She recently completed a Research Fulbright in Canada focusing on Arctic indigenous participation at climate negotiations. During her time in Ottawa, she received a Masters in International Affairs from the Norman Paterson School of International Affairs at Carleton University. In 2014 she worked with the Borders in Globalization project and took part in The Ecologic Institute's Arctic Summer College. Previously, she was a Junior Fellow in the Energy and Climate Program at the Carnegie Endowment for International Peace and co-authored a number of articles and major reports on urban mobility, clean energy technology, and climate change adaptation and mitigation in cities.

Comments or questions?

victoria.herrmann@thearcticinstitute.org

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PREFACE

Globalization, urbanization, and demographic shifts present Arctic policymakers and residents with the opportunity to reinvent circumpolar development for the 21st Century. The pages to follow offer an analysis of that opportunity in the context of Alaska ahead of the US Arctic Council Chairmanship. The report is an expanded compilation of three web articles by The Arctic Institute. The first article, *Investing in Place*, explored how to create livable, localized places in a globalized North. The second, *Investing in Innovation*, considered the opportunities of urbanization for entrepreneurship and economic ingenuity. The third, *Investing in Communities*, looked at ways to sustainably connect the growing young and old sectors of Alaska's population. Taken together in this report, globalization, urbanization, and population shifts provide a chance to redefine how we conceptualize, and realize, Arctic investment – a chance to turn economic growth into human development.

EXECUTIVE SUMMARY

The Arctic is changing at a rapid pace, and with it, the framework for northern development. No longer can leaders and inhabitants of the circumpolar north predominantly depend on natural resource production for economic growth. The effects of climate change and the volatile nature of commodity prices demand sustainable, flexible, and human-centered investments. The Arctic of today requires a development structure capable of promoting a diversified local economy, while simultaneously empowering communities to be climate resilient. While the European Arctic is effectively transitioning towards human development, Alaska's socio-economic advancement is still heavily reliant on resource extraction. Residents, planners, financiers, and policymakers from all levels of government must work together to ensure Alaska's wellbeing for generations to come.

THE MAKINGS OF A CRISIS IN THE NEW ARCTIC OF THE ANTHROPOCENE

Human development is an approach for advancing human wellbeing that focuses on the richness of human life rather than just the wealth of the economy. It measures human progress in terms of opportunities – giving people more freedom to live lives they value – and choices – providing people with opportunities, not insisting they make use of them.¹ The state of human development is the result of a complex set of interactions among economic, social, cultural, political, and environmental forces. Climate change and demographic trends are shifting the ground on which those socioeconomic interactions take place, and in turn are challenging the well being of individuals and communities in the Arctic.

- 87 percent of Alaska's state budget comes from oil and mineral related activities.² In the face of declining oil revenue, Moody's Analytics have revised Alaska's economic outlook from "stable" to "negative."³ Even with the potential for a rise in global oil prices, cheaper unconventional oil production in the south and a pending climate change deal limit Alaska's future reliance on petroleum revenue.
- Globalization and climate change have created unprecedented connectivity for the Arctic through communication systems, global markets, and environmental cooperation. The combination of rapid and stressful change brought about by economic internationalization, geopolitics, and global climate change challenge the wellbeing of residents, local communities, and many northern economic sectors.
- In 1920, only 6 percent of Alaska's population resided in urban areas. Today, that number is 66 percent, with 49 percent of all Alaskan Natives living in the five most-populous boroughs.⁴ While this is still far below the level of urbanization for the entire country, which currently stands at 82.4 percent, Alaska is unique in that 55

percent of the state population resides in just two cities – Fairbanks and Anchorage.⁵

- The population of Alaska is projected to increase by 28 percent to 915,211 by 2035, nearly double the national population growth rate in the same period.⁶ With lower infant mortality rates and better medical treatment for the elderly, the two biggest demographics poised to grow are the two most vulnerable – the youngest and oldest sectors of Alaskan society.⁷

HOW GOVERNMENTS CAN DEVELOP SUSTAINABLE INVESTMENT SOLUTIONS

The US Chairmanship of the Arctic Council provides the American government an opportunity to reverse its neglect of the circumpolar region. Through investments in place, innovation, and community in Alaska, America can help to redefine northern development for the 21st Century.

Improve infrastructure selection and development schemes to invest in place over petroleum. Harnessing the political decentralization, economic connectivity, and international information sharing benefits of globalization can help transform Arctic settlements into livable communities independent of the extraction of a single resource. Smart growth, a type of community planning that encourages compact, walkable, and sustainable development, should guide the investment priorities of Alaska's built environment.

Establish local business opportunities and entrepreneurship support systems that generate investment in local innovation over multinational industry. Creating a strong reputation for commitment to investment in research development, creativity, and design can provide incentives for entrepreneurship and the efficient use of existing and new knowledge. The agglomeration effects of urbanization can be capitalized on to facilitate the spillover of expertise across different sectors to build the fixed capital for a knowledge-based, localized economy instead of infrastructure that supports extractive industries.

Augment Alaska's human capital and capacity by constructing schools that build inclusive communities for long-term resiliency. Revamping schools offers an opportunity to build a sense of community amongst Alaska's various demographic groups and nurture the education and creativity needed for an innovative economy. Complete schools promote intergenerational social cohesion; foster healthier living environments with localized safety nets; and strengthen support system for the development of students. Investing in education design can secure Alaska's current and future wellbeing during a period of intense economic, social, and demographic change.

Include stakeholders from all levels of government and different sectors in decision-making. Southern policymakers at the national level cannot be the only actors involved in reformulating Arctic investment. The past four decades have seen a continual increase in re-allocating economic and political decision-making to northern stakeholders. Admiral Papp, Secretary Kerry, and others in Washington must work together with a multi-level, multi-disciplinary team in order to make meaningful decisions on how to best support human development.

OIL, CLIMATE CHANGE, AND THE US CHAIRMANSHIP

Development in the Arctic has traditionally focused on economic outputs and natural resource extraction and production. Policy and business discussions on how to develop the circumpolar north regularly measure current and future success on gross regional production, petroleum field performance, reserves in metric tons, and the price of a barrel of oil. Climate change has served to exacerbate the focus of development on the economies of resources. Melting sea ice provides the potential for easier access to extract and ship natural resources to international markets and southern centers of consumption.

But development is more than resource production and economic output – it is about people too. Historically, development has been defined as the structural and long-term transformations of both economies and societies, and the actions taken to make those changes.⁸ After World War II and the need to invest in the reconstruction of Europe, development was transformed into a primarily economic endeavor. As Europe recovered and colonies gained independence, Western powers looked to transpose economic development to areas of Africa, Latin America, Eastern Europe, and Asia.

Over the past five decades, the ideas behind development policy and financing have moved beyond the singular dimension of economic growth. The Millennium Development Goals, set in September 2000 by the United Nations, hold testament to that transformation. They include public health, equality, education, environmental sustainability, and extreme poverty and hunger in their targets for world development.⁹ Through initiatives like the Millennium Development Goals, the United Nations, along with a number of other local and international actors, have reformulated the narrow focus of development based on economic growth and strong markets towards a new definition based on the wellbeing of communities and the individuals that form them.

Development is more than resource production and economic output – it is about people too.

Human development is defined as being “about people, about expanding their choices to lead lives they value. Economic growth, increased international trade and investment, technological advance – all are very important. But they are means, not ends. Whether they contribute to human development in the 21st Century will depend on whether they expand people’s choices, whether they help create an environment for people to develop their full potential and lead productive, creative lives.”¹⁰

In spite of this global paradigm shift from economic to human development, conversations and policy proposals concerning the North today still revolve around growth, profits, and the production

of natural resources. And yet, volatile global commodity prices and maturing oil fields compel Alaska to think beyond oil revenue to ensure human development for its residents. Climate change also necessitates a shift to a human-centric definition of development as it begins to affect health, education, safety, decent employment, and cultural traditions.

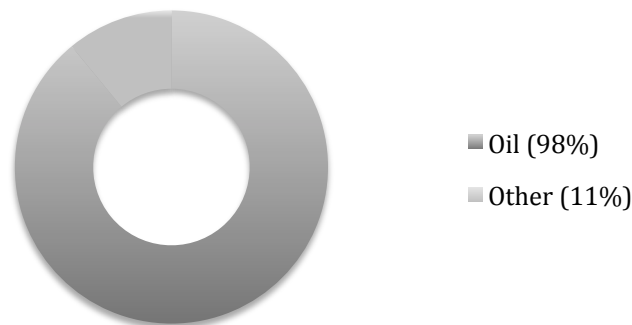
Now more than ever before, Alaska's development policy must transcend resource extraction and economic growth to prioritize the wellbeing of people and communities. The United States must harness the momentum of their upcoming Arctic Council Chairmanship in April to set an example of how to combine economic growth, human welfare, and community resiliency through local infrastructure investments for long-term prosperity and happiness of its Arctic residents.

THE RISE AND FALL OF GREAT ALASKAN OIL PRODUCTION

For many years, petroleum resource extraction was an effective and crucial component in securing economic growth and productive employment for Alaska. Since the discovery of petroleum at Prudhoe Bay on the North Slope in 1968, and long beyond its peak production in 1988, oil has been

the backbone of Alaska's economy.¹¹ Today, eighty-seven percent of Alaska's state budget comes from oil and mineral-related activities. The oil industry accounts for roughly one third of Alaskan jobs, and over half of the state's entire economy.¹²

ALASKA GENERAL FUND



Oil is still an important element of Alaska's economic vitality; however, mature fields, climate change, and failing oil prices pose a major threat to its ability to support growth not only in the future, but also at present. As oil wells continue to produce less, production in Alaska has fallen to less than a quarter of what it was in the late 1980s.¹³ Globally, oil prices have fallen steeply since the final months of 2014. Alaska's state budget for 2015 was based on oil at \$105 a barrel; the actual price of oil in March 2015 is just under \$50 a barrel.¹⁴ With a sixty percent decline in price, the state government will face a \$3.5 billion shortfall in spending. Governor Bill Walker has proposed a cut in government spending of between five and eight percent this year, with a total cut of twenty-five percent over the next four years if prices stay low.¹⁵

Falling oil prices not only threaten Alaska's economy; they also jeopardize the potential for human development. As the United Nations Report stresses, economic growth is a means to an end and not

an end in itself. The goal of economic success is to make decisions and investments in building human capacity in the individual to lead a decent, healthy, educated, and empowered life. With decreased oil sales, and in consequence state budget cuts, comes a decrease in government spending on social issues like healthcare and education – the foundations of a decent, healthy, and educated life. A projected \$3.5 billion shortfall will inevitably reduce social and human services in the coming year. It will also erode the potential for future development by failing to support the most vulnerable sectors of Alaska’s population – the elderly that hold the knowledge of how to thrive in the Arctic and the youth that will decide the Arctic’s future.

But the effects of Alaska’s dwindling oil economy go far beyond cutting state welfare programs from the current dip in price. Between 1979 and 2007, the average real income for all workers in Alaska dropped by more than ten percent – making Alaska the only state in the union where total income declined.¹⁶ During that same period, the average income of Alaska’s top one percent of earners, the vast majority of which are employed in oil, more than doubled and captured all of the state’s income growth.¹⁷ While Alaska’s per capita income of \$49,436 remains significantly higher than the US average, this number is reliant on petroleum production. Alaska can levy one of the lowest tax burdens in the country because of the money brought in through petroleum production. As the economy currently stands, a reduction in petroleum production is a major threat to the wellbeing of Alaskans.

Alaska is in need of a varied economy that will safeguard the health, safety, education, and prosperity for all citizens.

Alaska’s petroleum industry – a finite energy source – has been in steady decline for nearly three decades, and yet there is no large-scale move to augment other sectors of employment. Petroleum-led development often acts as a barrier to economic diversification. Investment in petroleum provides built infrastructure for the development of industry, not the development of people. When mature fields like Prudhoe Bay become unprofitable to producers, a third of Alaskans will be unemployed without the choices offered by a

diversified economy to live a productive life in a post-oil Alaska.

Human development ultimately rests on the provision of choices. Extractive industries do not foster an environment for local residents to develop their full potential and lead productive, creative lives once the wells dry up. The recent fall in oil prices have given cause for all Alaskan’s to rethink their reliance on oil for economic security. Even if an individual is employed outside of the petroleum sector, their welfare, public services, and safety nets are all dependent on the production of the single resource. Alaska is in need of a varied economy that will safeguard the health, safety, education, and prosperity for all citizens while concurrently supporting a range of employment choices.

WARMING, MELTING, AND THAWING AT THE TOP OF THE WORLD

Climate change is arguably the biggest transformative force in Alaska for the 21st Century. The Arctic is warming at a rate of almost twice as much as the global average, making climate change’s effects in the circumpolar north far more intense and rapid than most of ecosystems on the globe.¹⁸ Melting sea ice results in both dangers for hunting and inter-community travel but also opportunity

OBAMA'S CLIMATE LEGACY: NO GREATER CHALLENGE

During the 2015 State of the Union speech, President Obama made his determination to leave a climate change legacy clear. “No Challenge,” he began, “no challenge – poses a greater threat to future generations than climate change.” In his final years in office, President Obama has put much effort into climate change mitigation policy both at home and abroad. Domestically, the share of renewable energy has grown to 13 percent of total electricity generation during his tenure, assisted by the federal stimulus package. With the help of the Environmental Protection Agency, President Obama has increased efficacy requirements for the nation’s vehicle fleet, proposed emission standards for new and existing power plants through the Clean Power Plan, and has personally opposed the construction of the XL Keystone Pipeline from the Canadian oil sands.

In November 2014, President Obama and Chinese President Xi Jinping announced a joint agreement to reduce GHG emissions by 2030, with America reducing GHG emissions by 28 percent from 2005 levels by 2025. The President has also pledged to contribute three billion dollars to the UN Green Climate Fund over four years to help developing countries adapt to a shifting environment. These international initiatives have set the United States up to be a key leader at the UN climate negotiations later this year in Paris.

But President Obama’s climate legacy is juxtaposed against his administration’s continual support of hydraulic fracturing and fossil fuel exploration and export. During his time in office, the President has often boasted that, “The world’s largest oil and gas producer isn’t Russia, it’s not Saudi Arabia, it’s the United States.” Through two presidential elections, President Obama ran on a platform of energy independence for North America, with the majority share of energy coming from unconventional oil and gas production.

The contention between his climate legacy and domestic energy independence may come to a head in the Arctic. In April 2015 the Obama Administration both formally sent Congress recommendations to set aside a majority of Alaska’s Arctic National Wildlife Refuge as wilderness and validated a seven-year-old auction of Arctic drilling rights to Shell Oil Co. The former proposal would ban oil and gas drilling across 12 million acres of the Refuge, including the Coastal Plain, which is projected to contain 5.7 billion barrels of recoverable oil. Environmental groups, who hope to see the preservation made permanent through congressional action, loudly applauded the proposal. Conversely, the validated auction allows Shell to move forward with plans to drill in the Chukchi Sea this summer, about 70 miles off the coast of Alaska. The Chukchi Sea lease is estimated to hold roughly 4.3 billion barrels of oil and 2.2 trillion cubic feet of natural gas – but drilling will come at a price. The final environmental impact statement by the Department of the Interior notes that there is a 75 percent chance of at least one large spill that releases more than 1,000 barrels of oil over 77 years of development on the leases. The US Chairmanship of the Arctic Council will be a major test to President Obama’s political agility in balancing climate change and energy independent.

for southern access. Shoreline erosion, forest fires, and storm surges threaten the safety of coastal communities and in extreme cases force the relocation of entire towns inland. Thawing permafrost compromises the stability of transportation, sanitation, and public service infrastructure built upon its once sturdy foundations. These ecological changes have brought the Arctic in from the fringes of political and public minds into the front pages of print media and geopolitical reports. The melting Arctic provides enthralling narratives of an economic resource rush, of vulnerable communities falling into the ocean, of a new Cold War between east and west, and of threatened animals like polar bears.

Though its impacts on the planet are severe, climate change is transformative because its consequences reach much further than the realm of environmental science. It not only alters the physical landscape, but also affects all human development, economic growth, social policy, and public rhetoric surrounding the Arctic. At the local level, climate change affects how to craft welfare policies in an era where more financing is required for unprecedented needs like adaptation and climate security. Nationally, President Obama's intent to leave a climate action legacy in his final years in office is influencing his decisions on America's petroleum investments, including drilling in Alaska. Internationally, the upcoming United Nations Framework Convention on Climate Change Conference to be held in Paris, December 2015, brings the potential for a comprehensive, binding global climate agreement that would affect any future choices on developing fossil fuel reserves.

Accordingly, the State Department and White House have identified it as a major focus for the upcoming Chairmanship. As Admiral Papp noted in one of his first speeches as US Special Representative to the Arctic, "Climate change is central to all that we do. And we have to come up with ways to adapt to the changes that are occurring in the North for our people."¹⁹ He maintains that he must act in the world of consequence management in his appointment as Special Representative, and therefore work towards a strategy of assisting remote communities with adapting to rapid changes, including the treats to energy and water security through more climate-resilient decision-making.

The US as Arctic Council Chair must sustain economic growth for northern communities while simultaneously adapting to and mitigating climate change.

Thus far, climate change action and rhetoric at the federal level concerning the Arctic has taken a southern perspective. Melting ice means the Arctic Ocean is accessible to navigation through the Northern Sea Route, the Bering Strait, and increasingly the Northwest Passage. Admiral Papp has often spoken about the prioritization of collaborative search and secure efforts, shipping regime development, and the protection of marine ecosystems.²⁰ Meanwhile, President Obama and his administration have focused on climate mitigation and environmental preservation, as seen by his proposal to restrict drilling in the Arctic National Wildlife Refuge, among other executive actions on fossil fuel production and greenhouse gas emissions.²¹

Both a more robust maritime management system and carbon mitigation are enormously important. However, not prioritizing adaptation efforts to the same level can be isolating for northerners who are experiencing the effects of climate change in a very practical sense. On a micro-level, climate change poses heightened risks immediate to everyday life, human health, and economic prosperity. For Alaskans, the Arctic is a beautiful wilderness to be protected, but it is also a homeland where

people live and work that is in serious need of improving good employment opportunities and living conditions.

Alaska, and the rest of the Arctic, needs both adaptation and mitigation in the face of a changing climate. Policy initiatives must consider the long-term costs of emitting greenhouse gasses, but also acknowledge the immediate dangers that emissions are producing at the top of the world for individual safety, community wellbeing and Alaska's financial prosperity.

THE UNITED STATES AS AN ARCTIC NATION

The role of the chairmanship comes at the nexus of these two issues – sustaining economic growth for northern communities while simultaneously adapting to and mitigating climate change. The priorities set forth by Admiral Papp testify to that link. Beginning in April 2015, the US will focus on Arctic Ocean safety, security, and stewardship; economic and living conditions of Arctic communities; and climate change mitigation and adaptation.²² Coming off of the Canadian Chairmanship's theme of "Development for the People of the North," Admiral Papp has worked hard to highlight his attention to economic development in the High North for the wellbeing of its inhabitants within the overarching climate change framework of President Obama's legacy. But the balance between climate science and development rhetoric has proven difficult.

A rift has opened up between those in Washington and stakeholders in Alaska about how to best wield the power, both actual and symbolic, of the Chairmanship. In March of last year, the Alaskan State Legislator unanimously passed House Joint Resolution 24, a bipartisan work that urges the Federal Government to consider Alaska's priorities and work with state legislators in creating Arctic policy.²³ It advocates for a focus on creating jobs and economic opportunity for Arctic residents;

Though its impacts on the planet are severe, climate change is transformative because its consequences reach much further than the realm of environmental science.

suicide prevention; developing safe and sustainable sanitation facilities for smaller, isolated Arctic communities; and safe, secure, and reliable maritime shipping. While the State Department has acknowledged the importance of ocean security in its priorities, many political leaders in Alaska are dismayed at the elevation of climate change at the expense of more practical economic and social issues.

President Obama's recent proposal for new protections on large portions of the Arctic National Wildlife Refuge only worsens the divide. His administration has recommended that millions of additional acres of the

Refuge be declared "wilderness," the highest level of protection available for public lands that prohibits mining, drilling, roads, vehicles, and permanent structures.²⁴ If taken up by congress, the total areas declared Wilderness would increase to 12.28 million acres, nearly double what it is today. Alaskan Governor Bill Walker, an independent, has stated that the unilateral decision may force him to accelerate oil and gas permitting on state lands given Alaska's current budget shortfalls, while Senator Lisa Murkowski has called it an attack on Alaska's state sovereignty.²⁵

Perhaps the biggest issue between federal and local authorities lies in the perception of community engagement. The Alaska Arctic Policy Commission letter to Admiral Papp and subsequent report on

suggested priorities for the US Arctic Council Chairmanship – what House Joint Resolution 24 is based upon – went to great lengths to include a diverse set of Native and non-Native Alaskan’s input and personal priorities. In contrast, federal decision-making is often seen as unilateral and a continuation of the paternal colonialist model of governing Alaska has worked hard to reform.

Although the chairmanship does not provide much policymaking power in itself, the US leadership has promoted Washington to emerge from its decades long neglect of the Arctic region. The federal government has named its first Special Representative to the Arctic and has been active in attending and engaging in international Arctic conferences and high-level political meetings. However, Alaskan stakeholders worry that the interest in federal investment in Arctic policy and economy will be short lived – two years to be exact – and may prove to be a missed opportunity without more cooperation between national and local leaders.

HUMAN DEVELOPMENT FOR PEOPLE, PROSPERITY, AND PLANET

Many have critiqued the Federal Government and US Chairmanship’s focus on climate change as a southern view. It focuses more on how the Arctic region relates to Washington’s policy concerns and economic benefit rather than centering on the challenges and concerns of those who live there.

But human development in the Arctic must be all encompassing. It is a multidisciplinary, multi-level effort, one that includes considerations of both the economy and the environment in decisions of how to best build local human capacity and vitality. People-centric development of the Arctic for the 21st Century requires a matching of interests outside the sixty-sixth parallel with those from communities inside the circumpolar region to generate net benefits for all.

The next two years provide a chance for national and local stakeholders in Alaska to work together towards meaningful human development and a sustainable, resilient economy for today and the state’s future. Instead of seeing each other as antagonists across a widening sociopolitical gap, federal policymakers and Alaskan leaders should join forces to act at the intersection of climate change, economic growth, and public wellbeing.

Investing in place, innovation, and community provides a framework for multilevel and multidisciplinary collaboration. Investing in place requires making policies and infrastructure investments that shape livable, climate resilient places for Arctic residents to pursue healthy, safe, and productive lives in a changing physical landscape. Stimulating innovation in Alaska necessitates creating opportunities for entrepreneurship and localized economic ingenuity that can create the diverse economy Alaska needs in the face of declining petroleum revenues. Fostering communities demands policymakers to connect the growing young and old sectors of Alaska’s population to build current and future social capital. Together, place, innovation, and community provide a chance for stakeholders from all levels to work together to redefine Alaska’s future – a chance to link economic growth with human development.

A FRAMEWORK FOR INVESTMENT

If left to progress organically through market forces and economic trends, development in the Arctic would prioritize monetary benchmarks as indicators of success. Today in Alaska, petroleum production and pricing is often used as a proxy to measure Alaskans' wellbeing. Resource production, gross regional product, and income per capita are all elevated as key, quantifiable indicators to guide investment in the circumpolar north. Redefining development from extractive industry and towards human-centered local activities requires the creation of a new framework for investment. A strong, nationally supported structure for community-oriented investment in Alaska is essential to sustainably manage its rapid social, ecological, and geopolitical changes. But in order to construct a new framework for investment, it is first necessary to understand what human development is, how it is applied to the Arctic, and in what ways can it be tied to resiliency.

When investing in human development, financiers are investing in opportunities and choices.

2015 marks the 25th anniversary of the release of the first Human Development Report by the United Nations Development Programme.²⁶ In 1990, the first Report introduced a new approach for advancing human wellbeing by measuring whether people were able to be and do desirable things in life. Rather than seeing economic growth as an end in itself, this new paradigm considered it a means to a more human-centered end.²⁷ With the introduction of this report, development planning gradually transformed from focusing on increasing gross national products to developing people's abilities and giving them a chance to use them.

When investing in human development, financiers are investing in opportunities and choices. A key objective in human development is to augment people's abilities and give them a chance to use their skills. By creating opportunities for education and access to resources needed for a decent standard of living, governments create an environment for people, both individually and collectively, to develop to their full potential and have a chance of leading a productive and creative lives that they value.²⁸

UNDERSTANDING HUMAN DEVELOPMENT FOR THE ARCTIC

While there are some similarities between the work of the UN Development Programme across the globe and an Arctic specific context, human development looks different from the top of the world. Investing in Alaskan's wellbeing must take into account a unique, rapidly changing physical environment, major population demographic shifts, globalization trends, and urban migration. It must also be aware of the physical and political distance between circumpolar peoples and the state

that encases them. Perhaps most importantly, Arctic human development, and its measurement, must be culturally sensitive. It must be conscious that spending time on the land, learning traditional knowledge from elders, and safeguarding a sense of community may hold more value than high wage-based commodities.²⁹

REGIONAL PROCESS AND GLOBAL LINKAGES

In February 2015, the Stefansson Arctic Institute released the second volume of the Arctic Human Development Report. The report sought move beyond the first report in 2004 in assessing and synthesizing the progress of human development in the Arctic. It's major, policy relevant findings include:

- The combination of rapid and stressful changes highlighted in the first report continue today, amplified in rate and magnitude.
- There has been an increase in indigenous empowerment and improved local political and economic authority.
- Outmigration from rural communities towards larger settlements, in part due to 'climigration,' has resulted in a rural brain drain.
- The demands on local and indigenous representatives are stretching resources, human and fiscal, to their limits.
- The Arctic has become more marketable, and Arctic identities are increasingly seen as an asset.
- Expectations are high for the expansion of resource extractive industries from climate change, but interest in economic diversification is also rising.

Recognizing the distorted nature of applying the UN Human Development Index to measure human development in the Arctic, the Arctic Council supported a separate documentation of Arctic residents' wellbeing around the circumpolar north.³⁰ Taking social, economic, and environmental changes into consideration, Iceland, through its Arctic Council Chairmanship, endorsed the first Arctic Human Development Report in 2002. The document aimed to provide "a comprehensive knowledge base for the Arctic Council's Sustainable Development Program," to "serve as a point of departure for assessing progress in the future."³¹ Moving past dimensions of human wellbeing that revolved around resource extraction, the report addressed Arctic demography, political, economic, and legal systems, community viability, human health, education, gender issues, and international geopolitics. Instead of providing a longitudinal survey of human development the 2002 Report, and its second installment in 2015, offer two snapshots of the region's development at a particular point in time, to be used as a baseline from which to measure future change.

In order to measure human development, the Stefansson Arctic Institute in Akureyri, Iceland followed-up the Development Report with the Arctic Social Indicators Project. The project has created indicators specific to the Arctic to help track and monitor human development over time.³² The indicators reflect Arctic cultures, the evolution of indigenous rights, and differences in circumpolar human welfare. The six domains of indicators developed include (i) fate control and/or the ability to guide one's own destiny; (ii) cultural integrity or belonging to a viable local culture; (iii) contact with nature or interacting closely with the natural world; (iv) material wellbeing; (v) education; and (vi) health and demography.³³ These indicators were created as a guide for not only governments to gauge the progress of human-centric development, but also to empower citizens to assess their own wellbeing, and inspire them to advocate for more equitable decision making.

A FRAMEWORK FOR INVESTING IN RESILIENCY

Although not identified as a separate criterion in measuring human development, resiliency is present in all six domains identified by the Indicator Project. Safeguarding and at times rebuilding resiliency is vital to a healthy and secure future for Arctic communities. Resiliency is defined as the

Both climate and socio-economic changes are simultaneously affecting the ability of polar systems to absorb and adapt to disruptions.

interwoven nature of social-ecological systems.³⁴ It is a concept that exists at the nexus of human economies and ecological ecosystems and emphasizes that humans are part of and function interpedently with nature. To be resilient is a measurement of the capacity of the interdependent system to cope with disturbance and recover in such a way that it maintains its core function and identity.³⁵ It also requires the system to maintain the ability to learn from and adapt to changing conditions, and, when pushed past a threshold, to transform itself. Transformations include a fundamental shift in the system towards a new regime characterized by a different set of critical natural-human interactions.³⁶

The Arctic is experiencing rapid change. While climate change is a significant source of circumpolar challenges today, social, political, and economic drivers are of equal importance. Urbanization, demographic population trends, globalization, and cultural shifts create a more gradual change to the Arctic system than abrupt climate disturbances. Both climate and socio-economic changes are simultaneously affecting the ability of polar systems to absorb and adapt to disruptions. In this way, climate change acts as a threat-multiplier to other social and economic stressors of a 21st Century circumpolar north.

Adopting a resilient framework for investment in human development necessitates an integrative, multi-scalar approach for assessing linked social and ecological changes and identifying thresholds that, if passed, could have long-term consequences for future development. Investments must be targeted at infrastructure and programs that build capacity to respond to change. The capacity to adapt it based on a matrix of interrelated factors, including knowledge, a capacity to work collectively as a community, skill building, financial resources, and build infrastructure.³⁷ Any decision to build or invest in development must be cognizant of the risks of interacting new ecological and social changes, but also understanding of traditional sources of resilience. Indigenous culture and traditional ways of making decisions have historically proven resilient.³⁸ Giving attention to diversity in food sources and amending subsistence practices to a changing environment, for

example, have been important methods of adaptation. However, some options for responding to change have been compromised by past decisions and interventions that have eroded traditional safeguards of resilience. Using a resilient framework for human development demands investments that rebuild resiliency through co-management, social learning, and incorporation of local and traditional knowledge.

KEY AREAS OF INVESTMENT

In order to move beyond an extractive economy that primarily benefits those living below the Arctic Circle, a shift in paradigm towards Arctic human development must be embraced. And in order for that development to be ecologically, economically, and socially sustainable in the long term, it must adopt a resilient framework. The following three chapters, *Investing in Place*, *Investing in Innovation*, and *Investing in Community* all put a resilient framework into action through projects that promote human development. They support projects that focus on augmenting the baseline factors of resilient capacity, like education, communal problem solving, and built infrastructure detailed above. They are also designed to improve the six domain indicators identified by the Arctic Social Indicators Project, with a special focus on deficiencies in Alaskan wellbeing highlighted by the 2015 Arctic Human Development Report. Collectively, these three areas of investment provide the US government a suggested parameter for how to build resiliency and improve the socio-economic wellbeing of its Arctic citizens.

INVESTING IN PLACE

Today more than ever before, the circumpolar region is integrated into the international system.³⁹ Although the North has always been connected to the rest of the world through trade networks and migratory routes, globalization and climate change have created unprecedented connectivity through communication systems, global markets, and environmental cooperation.

But the Arctic is not just connected globally – it has quickly moved from the periphery towards the world's center stage.

Flag plantings on the ocean floor, shipping prospects for financial prosperity, and images of polar bears on icebergs are just a few narratives that collectively construct the Polar Vortex craze that's consuming media, politicians, businessmen, and the global public alike.

With such linkages facilitating a marketable awareness of the Arctic through science and geopolitics, it is easy to forget that globalization is a two-way street. Oftentimes, the south still visualizes the Arctic as the last, albeit melting, frontier. However, the northern environment and its people are very much a part of, and influenced by, the international economic, political, and cultural developments of today.

Oftentimes, the south still visualizes the Arctic as the last, albeit melting, frontier.

For the past decade, globalization has been transforming the social and political milieus of the Arctic as much as climate change has changed its physical landscapes – if not more so. The second *Arctic Human Development Report* affirms that the combination of rapid and stressful changes highlighted in the first study ten years ago continue today, amplified in both rate and magnitude. It finds that the societal and environmental changes brought about by globalization and global climate change challenge the wellbeing of Arctic residents, local communities, and many northern socioeconomic sectors.⁴⁰

Globalization brings complex, multifaceted challenges to human development in the Arctic; but it also provides an opportunity for policymakers to retool globalization's effects to benefit communities in Alaska. Harnessing the political, economic, and social benefits of globalization can help build sustainable, locally oriented built infrastructure for the Arctic of the 21st Century.

GLOBALIZATION FROM THE NORTH POLE

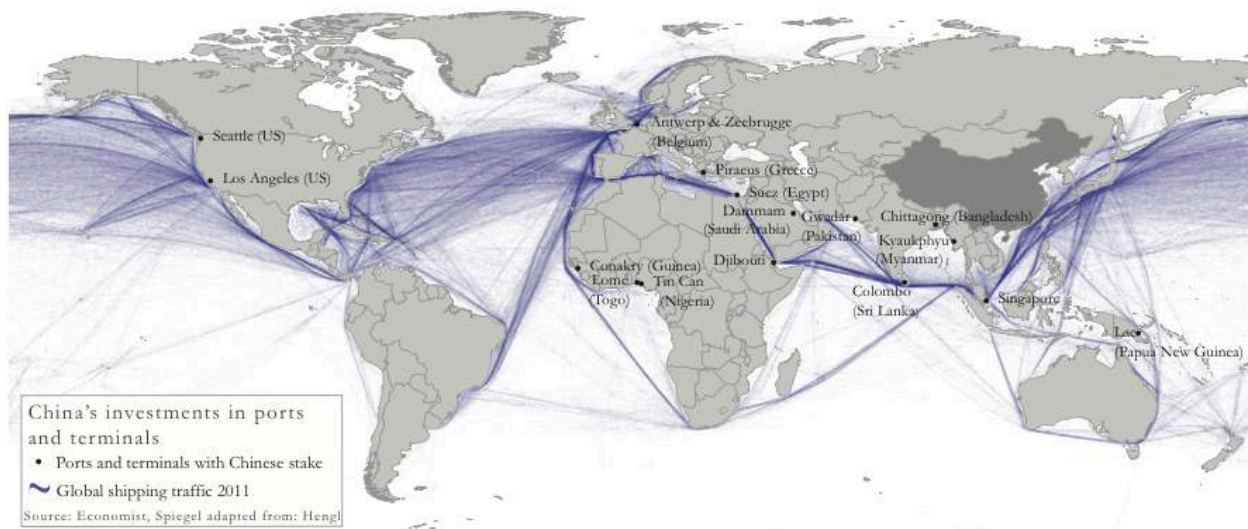
In many ways, the effects of globalization are no different for the Arctic than they are for the rest of the globe. Economically, globalization has internationalized the decision-making for resource

development. Extractive companies are increasingly multinational and operate according to the world's demand for and cost of producing and moving Arctic resources. This translates to the transfer of primary concerns away from places in the north to international headquarters and markets.

While economic globalization provides an opportunity to break the colonialist processes of 20th Century extractive activities, the increased mobility and privatization of capital also makes it difficult for governments to tax, support a welfare state, and protect the environment. Companies are too often interested in meeting the market test – expected revenues must exceed expected costs – without investing in long-term development.⁴¹

Today, the economic buzz surrounding an ice-free Arctic is growing. And yet, despite opportunistic rhetoric, the region's harsh climate conditions, its sparse population, and the remoteness of deposits will continue to drive production costs up.⁴² Beyond these conditions, the uncertainty in petroleum commodity prices from new unconventional oil production, a pending global climate change deal in Paris later this year, and the net costs of climate-induced storm surges and shoreline erosion also contribute to high costs of doing business in the north.

GLOBAL SHIPPING TRAFFIC 2011



Though not representative of all the links between the Arctic and the rest of the world, this map of global shipping traffic in 2011 visualizes the connectivity of Alaska to shipping routes to Canada, the Pacific Coast of the US, and Asia.

Globalized resource production and consumption will continue to be economically important in the Arctic. However, the worldwide volatility of petroleum prices, international climate treaties, and the negative consequences of global environmental shifts have created a space to rethink the northern economy.

These globalized trends that hinder investments in the large-scale, short-term infrastructure of extractive industry provide the chance to redefine Arctic development. Redefining what successful development means requires a new matrix of infrastructure investment that prioritizes employment diversification, the maintenance of social services at the local level, and the strength of small-scale design that together support a healthy, inclusive Alaskan society.

BEYOND PROFIT: THE INTERNATIONALIZATION OF PLACE AND PEOPLE

In order to move investment away from creating extractive settlements and into vibrant, livable communities, Alaska should take advantage of the positive socio-political effects of globalization. Politically, globalization has divested the power of state governments both upwards and downwards. The convening of Arctic nations in the late 1980s and 1990s established the Arctic as an international space, where regional and sub-national actors became important players in international relations. The Arctic Council and the Barents Euro-Arctic Council are products of the post-Cold War processes of fostering cooperation across East-West lines that empowered local actors.⁴³ Today, the Arctic's international links have moved beyond its immediate neighbors to countries like Singapore and South Korea. The communications revolution has enabled the exchange of knowledge, ideas, and practices from the North Pole to the Southern Hemisphere. Prior to this revolution, Alaskan communities only had easy access to design concepts, policy ideas, and infrastructure plans from their own governments and companies active in the Arctic. Now, with the

By capitalizing on political decentralization, Alaska can create local infrastructure that is both resilient to the economic challenges of globalization and supportive of its advantages.

advent of virtual and telecommunication, Alaskans can share, adapt, and build off of policy models and build best practices from a much larger, more international pool of thinkers and practitioners.

Conversely, there has also been devolution of power to local authority through political decentralization.⁴⁴ This transfer of authority to empower localities not only emboldens local governments and political leaders to make policies for their own communities – it also emboldens the voices of community members themselves. Being closer to decision makers

empowers the opinions and choices of societal subgroups with different needs informed by gender, class, age, and heritage.

This is particularly important given globalization's cultural impacts. With increased migration from the south, and internal migration within Alaska from rural to urban areas, come increased interactions amongst people with varied experiences, cultures, and identities. Day to day living in a globalized Arctic, much like daily life in New York or London, is comprised of countless cultural negotiations and contestations that culminate in a new definition of what it means to be “a Northerner.”

By accessing global communication and information sharing systems to support local development, capitalizing on political decentralization to include all stakeholders, and tapping into the rich cultural

and social positives of globalization, Alaska can create local infrastructure that is both resilient to the economic challenges of globalization the Human Development Report emphasizes and supportive of its advantages.

BUILDING A SMARTER ARCTIC

Originally, most Arctic settlements based on Euro-American colonialism and capitalism were built as extractive communities rather than places to live.⁴⁵ Their vitality was dependent on local resource extraction and their creation as small, remote settlements was based on where the highest concentration of these commercialized sea and land resources could be found.

Globalization processes, political centralization, and market volatility from more competitively priced natural resource production southward have created a space to redefine Arctic settlements as livable communities independent of the extraction of a single resource. However, while there have been a number of initiatives aimed at building community through arts festivals, community centers, and civic programming, the built environment that serves as the site for negotiating communal sustainability and viability has been overlooked.

COMPLETE STREETS FOR SKIING AND DOG SLEDS

The Arctic is not alone in this transition from investing in companies towards investing in place. The American Planning Association, a national organization that brings planners, citizens, and elected official together by providing leadership in the development of vital communities, conducted a national poll in 2014 on community preferences. Sixty-five percent of respondents believed that investing in schools, public transportation networks, and walkable neighborhoods was a better way to grow the economy than investing in business-oriented infrastructure. APA Executive Director Paul Farmer noted at the report's press release, "If there is a single message from this poll, it's that place matters."⁴⁶

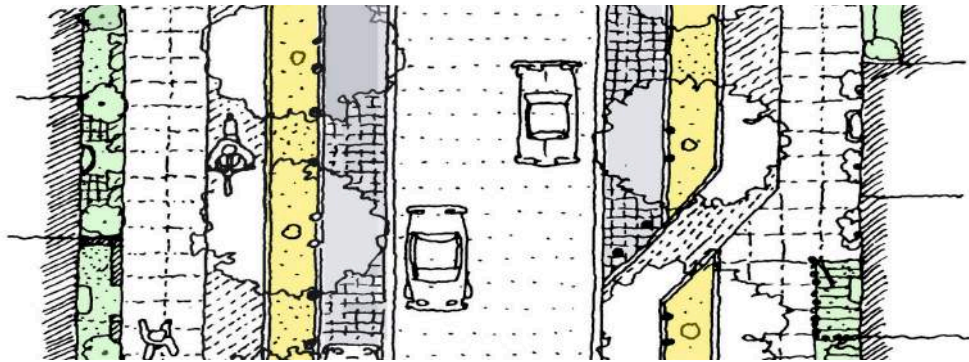
The lower 48 have development new planning strategies that create a built environment where place matters and resilient communities are built. Alaska is just beginning to adopt these design principles and adapt them to its particular geography. In early 2014 Senator Mark Begich introduced the Safe Streets Act, a national act from 2004 that requires states and regions to adopt Complete Streets policies for federal transportation project funding.⁴⁷ Complete streets are roadways designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists, and transit riders of all ages and abilities. In the Arctic, this also means building streets that are inclusive of cross-country skiers, dog sledders, snowmobiles, and all-terrain vehicles.

In the Arctic, complete streets means building transport infrastructure that is inclusive of cross-country skiers, dog sledders, snowmobiles, and all-terrain vehicles in addition to cars, pedestrians, and cyclists.

Anchorage, Fairbanks, and Juneau have already begun to adopt Complete Street models to provide safer, multimodal transportation networks that reflect Alaska's unique local demands of geography and climate. Fairbanks, for example, is replacing traffic signals with modern roundabouts, which cut congestion, emissions, and crashes while moving traffic more smoothly.⁴⁸ Anchorage has hired

several staff members to the city's transportation office to work specifically on conceptualizing and building non-motorized transportation pathways. Widening sidewalks, adding bike lanes, and reducing motorized lane widths on key downtown arterials to slow speeds down all enable safer, healthier transportation options for commuters, students, and community members.

COMPLETE STREET DESIGN



This drawing shows road infrastructure that accommodates cars, pedestrians, and cyclists simultaneously and safely. The yellow represent physical barriers between cars and people, while the green represent foliage between the street and homes.

Supporting complete street infrastructure has helped Alaska to become the top states in the nation in the proportion of people who walk or bike to work and top per capita funding for non-motorized transportation infrastructure in the last year. While both of these statistics are in part facilitated by Alaska's low population, they still speak to the influence complete streets have on citizen's transport choices, their perceived sense of safety, and the state's commitment to investing in place.

ADAPTING SMART GROWTH TO ALASKA

However, in order to truly invest in place and take advantage of globalization, Alaska must reach beyond pedestrian and bicycle friendly roads in its three major cities. Alaska must invest in smart growth infrastructure in both urban and rural communities, adapted to the Arctic's climate and geography, in order to build off of the current success of complete streets.

Smart growth is a type of community planning that encourages compact, walkable, and transit-oriented development. It focuses on sustainability and creating a unique sense of place through designs that (i) expand the range of transportation, employment, and housing choices; (ii) promote public health; and (iii) preserve local culture.⁴⁹ Through policy regulations like zoning ordinances, local growth boundaries, shared development rights, and environmental assessments, smart growth increases family income and wealth; provides safe walking routes for children; stimulates economic activity; and fosters livable, healthy places for diverse communities.⁵⁰

Kiruna, a small city in Sweden's North, has incorporated a number of smart growth elements into its new design. The city is in the beginning stages of moving its entire built-infrastructure and population eastward several kilometers over the next 100 years to allow the nearby iron mine to continue operations. The new plan, designed by Swedish firm White, aims to rebuild a denser, more

economic diversified city that can exist independent of its namesake mine. All new development will be oriented around a compactly built central town hall square surrounded by narrow streets.⁵¹

Vastly different than its sprawling neighborhoods today, these streets, designed to protect pedestrians from wind and encourage walking, will be filled with shops and cafes. Residences, converted into mainly apartments instead of single-family homes, won't be further than three blocks from a central green space built for cross-country skiing and tobogganing. Although the new plan incorporates many energy efficient building codes, the new Kiruna will go a step further to harness the excess heat created from the mine to power and heat the town. Beyond the physical infrastructure, Kiruna's smart growth planning is mindful of all residents and values a diverse set of viewpoints. The relocation team includes executives of the mining company, locally elected representatives, urban planners, residents, and anthropologists.⁵² Such a multidisciplinary approach ensures that the result is an inclusive, identity-rich community.

Smart growth does not just apply to cities. An increasing share of planning research focuses on the application of compact design and mixed land use patterns to rural and small towns. Small, cold-weather communities like Howard, South Dakota, small towns along US Route 1 in Maine, and Winooski, Vermont have all won national awards for adapting smart growth principles to sparsely populated areas.⁵³ Creating mixed use, green complexes as town centers, recycling temporary housing from once-mined areas into new compact neighborhoods, and developing sustainable regional transport plans are just a few examples of rural smart growth adaptations. An innovative Alaskan application of smart growth could come from including their principles in the planning process of towns relocated by climate change like Newtok or Shishmaref.

In addition to complete streets and the long-range regional considerations of sustainably, smart growth also supports mixed-use development and neighborhood schools, which will be respectively examined in Chapters Three and Four. Each component of this report, when woven together, creates a robust picture for sustainable investment and development that serves the economy, the community, and the environment.

HARNESSING THE POWER INFORMATION SHARING SYSTEMS

Many of the principles above have already been implemented south of the Arctic Circle. While some will need to be adapted to Arctic-specific contexts, much of the planning, foundational pillars, and practices will remain the same. Arctic communities should take advantage of globalization's communication and information sharing systems. Best practice sharing and collective brainstorming between successful communities and those in Alaska just beginning their investments in smart growth can provide much needed technical assistance.

C40 Climate Leadership Group, a 63-city network that aims to 'implement meaningful and sustainable climate-related actions locally that will help address climate change globally,' is one just one example of an already existing platform for best-practice sharing.⁵⁴ The network sees itself as an effective forum where cities can collaborate, share knowledge, and drive meaningful, measurable, and sustainable action. It does this by breaking the larger group down into smaller networks built on commonly identities opportunities, interests, and priorities. Staff at C40 help to facilitate peer-to-peer exchanges of knowledge, support, and novel ideas in developing policies, programs, or projects

connected to the groups theme. Toronto and Portland, for example, use the Delta Cities themed network to share ideas and give advice across borders. The Waterfront of Toronto is building mixed-use communities in the naturalized and flood-protected mouth of the Don River, while the South Waterfront District project in Portland is turning an underdeveloped industrial site into a mixed-use public area with parks, plazas, and river access.⁵⁵ Through the Delta Cities network, practitioners from Toronto and Portland are able to work through shared challenges together and cooperate on developing replicable solutions.

CLIMATE LEADERSHIP CITIES OF THE C40 GROUP



Each dot on the map represents a C40 city with distinct infrastructure and progress in addressing climate change. Together, they create a network of urban leaders to share technical expertise on best practices. Establishing a similar network of best practice sharing throughout the Arctic can help address unique polar economic, social, and climate challenges.

The durability of new practices can be reinforced by visits to successful communities by Alaskan planners and policymakers. For example, when Mayor Bill Peduto and County Executive Rich Fitzgerald prioritized bus rapid transit for the city of Pittsburgh, they took a cohort of business leaders, advocates, city staff, and other stakeholders to Cleveland to learn about the success of that city's HealthLine bus rapid transit project.⁵⁶ Stakeholders often credit study tours for opening up their horizons to find solutions to their local obstacles.

CONSTRUCTING CLIMATE RESILIENT BUILT ENVIRONMENTS FOR THE NORTH

Adapting smart growth design principles to neighborhood redevelopment and encouraging active transport through smart street design and walkable communities have the added benefit of supporting a low-carbon lifestyle. Smart growth and multimodal transportation choices with access to carbon neutral, safe options like bike lanes and walking paths can reduce American vehicle miles traveled (VMT) by 10 percent per capita from 2005 levels. This translates into an annual emissions reduction of 145 million metric tons of carbon dioxide in 2030 – the equivalent to the annual emissions of roughly 30 million automobiles.⁵⁷ And communities can achieve these reductions at a

net savings. The city of Portland, for example, will reduce emissions with investments in cycling infrastructure by 0.7 MMT of CO₂ while saving more than \$1,000 per ton CO₂ saved.⁵⁸

Smart growth also provides a robust bedrock for community adaptation to the effects of climate change. Climate change is a local reality for many Alaskans. Shoreline erosion, changing weather conditions, and thawing permafrost can all affect an individual's daily routines and the overall safety of a community. Such changes require Alaskan communities to identify ways in which they can adapt to adjust human systems to a changing environment that exploits beneficial opportunities or moderates negative effects.

Smart growth approaches consider where and how to develop and update a community's built environment in a way that supports adaptation to an uncertain future. Adapting successful smart growth projects from the lower 48 that have adapted public service systems to climate change can help Alaskan communities be more resilient. In smart growth neighborhoods, new buildings and infrastructure are conscious of potential changes, and therefore are built to be flexible to forthcoming alterations to both the built and natural environments. The Northern Kentucky Area Planning Commission, for example, partnered with the Environmental Protection Agency to create a smart growth infrastructure plan and handbook for cities within its region that included how to remodel climate resilient sewer systems.⁵⁹ Communities faced with sanitation concerns for overflowing sewer systems and accumulating storm water runoff can now turn to the handbook for help. The guide provides action points for wastewater management and green infrastructure that reduce pollution, ensure water security, and decrease runoff volume. Suggested actions prepare communities for greater fluctuations in weather conditions while simultaneously creating more interesting places to live, work, and play.

REDEFINING THE DEW LINE FOR THE 21ST CENTURY

Despite meaningful moves away from colonial policies, the globalized narrative of the North is still an extractive one. Political rhetoric, business forecasts, and climate science all measure the Arctic's significance in terms of benefits for the rest of the world. Because of its ecological vulnerability, the region is often called the canary in the coalmine for climate change. What happens in the Arctic in the years to come will be an early indicator of the future environmental changes for the rest of the Earth.

In a way, the Arctic is inevitably the world's Distant Early Warning line for climate change.

What's more, climate change consequences that are deemed unacceptable for the developed south, like rising sea levels, are not only tolerated in the Arctic, but also exploited. The anticipation of open waters has prompted countries to highlight the importance of their national Arctic territory for mineral development, shipping routes, and energy security for economic growth.

Rather than concentrate global attention on what can be extracted from a melting Arctic, the international community should focus on the new avenues globalization has created for investment in, and knowledge exchange with, Alaska. Unstable markets and high cost of production provide policymakers in Juneau and US the chance to reformulate how they make decisions on infrastructure investment – the chance to invest in livable, sustainable places rather than resource rush settlements.

Investing in complete streets and smart growth principles is one key way to take advantage of that opportunity. It capitalizes on globalization's decentralization of political power; utilizes today's international communication and information systems; and supports the rich, diverse cultural perspectives of Arctic residents. Smart growth provides the physical infrastructure to increase productivity and innovation, to develop a thriving local economy, and to take advantage of access to global markets. The analysis presented in Chapter Four builds off of the physical infrastructure detailed here by exploring how to create policy and institutional infrastructure that works in tandem with Alaska's built environment to encourage a diversified economy.

In a way, the Arctic is inevitably the world's Distant Early Warning line for climate change. The North Pole, along with other geographies like small island nations in the Pacific, will be the first and potentially hardest hit by ecological shifts and weather pattern variations. But unlike the original Distant Early Warning (DEW) Line, national and international policymakers today must think beyond constructing expensive, isolated stations that provide security to the lower 48 but little to Arctic peoples. Investing in place means moving beyond the dominating narratives of extractive Arctic globalization from a southern perspective. Investing in place means investing in local infrastructure that foster economically, environmentally, and culturally thriving communities for the 'northerners of the 21st Century' that live there.

INVESTING IN INNOVATION

In January 2015, President Obama announced that he would ask Congress to ban drilling on 12 million acres of the Arctic National Wildlife Refuge in Alaska.⁶⁰ While environmentalists applauded his efforts, the ban was met with fierce opposition from a number of politicians. Alaskan Senator Lisa Murkowski called it “a stunning attack on our sovereignty and our ability to develop a strong economy that allows us, our children and our grandchildren to thrive.”⁶¹

Despite such outcries, President Obama’s proposal to explore options for economic development beyond oil drilling may be protecting Alaska’s economy as much as its environment.

The second Arctic Human Development Report, released in February 2015, concludes that prohibitively high costs of doing business in the north will persist long into the 21st Century in spite of high expectations for a climate-induced resource rush.⁶² The net costs of climate change, combined with the volatility of commodity prices, will continue to push investments down in Alaska’s already declining petroleum production.

Major commercial conditions such as an uncertain future for Arctic oil is important to northern human development, as economic activities define the material well being of the region’s residents. With the prospects of expanding petroleum markets proving overly optimistic, President Obama’s drilling ban provides an opportunity to move Alaska’s economy beyond extractive industries and towards investing in human development through a knowledge economy.

Restructuring the state’s economy from resource-focused to human-centered means investing in institutional and physical infrastructure that will best serve current and future Alaskans. Architects of a new economic framework must be conscious of Alaska’s development history, able to build within the major overarching trends of change today, and mindful of the Arctic climate’s future shifts. Informed by an understanding of its past, present, and projected future, Alaska has the tools to make sound, sustainable economic decisions and the means to redirect investment towards local innovation.

THE ARCTIC: AN ECONOMIC HISTORY

Ten years ago, the first Arctic Human Development Report noted that the circumpolar north was a natural resource reservoir that could quench the world’s energy and mineral appetite. It also highlighted the trend in Alaskan history of petroleum dominating both economic activity and state investment, though it noted that there was a recent reduction in the role of government and federal

subsidies to support extractive activities.⁶³ While the report touched on the beginnings of privatization and diversification of the local economy, citing new power in companies and new activities like tourism as major changes, the first report's economic analysis in 2004 relied substantially on evaluating resource markets and effects.

Today, both of those original statements, the Arctic as an energy reserve and as a resource-dominated economy, still hold true. A USGS survey estimates that the Arctic holds almost a quarter of the world's undiscovered conventional oil and gas.⁶⁴ Unsurprisingly, Alaska's economy is still deeply entrenched in its extractive legacies. The intermediary decade between the first and second Human Development Report saw the invention of a number of new technologies and processes to increase oil production, resulting in a dramatic expansion in the Arctic regional economy. Between 2000 and 2010, the Arctic's regional growth far exceeded that of the eight individual Arctic nations. Its economic output, 0.6 percent of world GDP, was four times its share of the population, and at 442.8 Billion USD, the Arctic Gross Regional Product was equal to the entire national economies of Malaysia and Columbia in 2010.⁶⁵

ARCTIC ECONOMIC COUNCIL

In September 2014, the Arctic Economic Council (AEC) held its first meeting in Iqaluit, Nunavut. The Economic Council was an idea conceived by the Canadian government while Chair of the Arctic Council from 2013 to 2015. In line with their overarching aim of sustainable economic development for northerners, the newly formed AEC is an independent organization that will facilitate Arctic business-to-business activities and responsible economic development through best-practice sharing, technological solutions, standards, and virtually available informational recourses. On its webpage, the Council will feature Arctic company profiles, business trends, and quarterly activity reports. Although it will serve as a primary forum for interactions amongst the circumpolar business community, it will also work closely with Arctic Council members to provide advise and a business perspective on specific areas of cooperation.

At present, the AEC has focused on supporting innovation in natural resource-based industries, including mining, fishing, reindeer herding, and Aboriginal Economic Development Corporations. However, the Council aims to support all types of economic ventures, with a special focus on small local businesses, to nurture responsible and sustainable Arctic development. 2015, its first full year of operation, provides the opportunity to establish the AEC as a strong support system for both natural resource companies and knowledge-based Arctic entrepreneurs. By building its virtual and physical capacities to accommodate the unique challenges of Northern innovators, the AEC can provide the much needed backbone infrastructure for local economic, human-centric development to thrive.

Some financial forecasters, particularly those cited by mass media outlets, are optimistic that high growth rates will climb even higher from the economic benefits of climate change. Throughout its globalized modern history, the biggest challenges of doing business in the Arctic have always been

the region's harsh climate and the remoteness of resource deposits from centers of consumption, production, and decision-making. The price of researching and developing cold-weather equipment and the increased costs of shipping out products and bringing in material, labor, and other resources to production sites all add to the high cost and debatable viability of doing business in the high north when compared with more temperate sites.

Climate change has the potential to change those environmental conditions once thought of as fixed. Warmer air and water are prolonging the ice-free travel period in Arctic seas, improving access and lowering costs of delivering supplies and bringing products to international markets. Warmer temperatures also mean that there is a reduced need to invest new technologies to withstand extreme conditions.

Despite optimistic business reports and news stories based on a resource rush narrative, climate change is a net cost to both those who live in and those who extract resources from the Arctic.⁶⁶ The future of an ecologically changing Arctic is uncertain. Increasing storm surges, shoreline erosion, and thawing permafrost are all challenges to existing and forthcoming industry infrastructure.

But perhaps more worrisome than the impacts of climate change is Alaska's maturing resource economy as petroleum production declines. Oil production in Alaska peaked more than two decades ago, and although new fields and new production technology have slowed the decline production continues to fall.⁶⁷ With new unconventional and shale reserves being tapped in more environmentally hospitable places like North Dakota and southern Canada, world energy demands can be met without drilling in America's circumpolar north.

Despite the Arctic visual narrative of barren white icescapes, more than half of Alaskan residents now live in cities.

Oil revenue has significantly contributed to Alaska's revenues, employment rate, and ability to provide welfare services from taxes since the onset of its production at Prudhoe Bay in 1977. Today it accounts for ninety percent of the state's revenue, and it is estimated that direct activity in the oil industry and the effects of the state's spending on oil account for one-third of Alaskan jobs.⁶⁸

Reliance on oil for financial and human well-being pose a major challenge for Alaska, but also an opportunity to rethink how it invests for an economically sustainable future. Although a number of state savings funds, of which Alaska's Permanent Fund is the largest, will soften the effects of the petroleum decline, Alaska needs a new, more resilient economy for the 21st Century. Other natural resource industries in the state are too small to fill the gap left by petroleum – giving Alaska the chance to think beyond resource-generated wellbeing.

GLOBALIZATION AND URBANIZATION: A CATALYST FOR INNOVATIVE GROWTH

A new economic structure must be built in the context of the major, overarching trends identified by the Arctic Human Development Report – namely globalization and urbanization. Taken together, globalization and urbanization in Alaska provide not just the context for redefining investment; each trend provides valuable conditions to foster an economy built on sustainable innovation and resilient

entrepreneurship.

Chapter Three explored the challenges and opportunities of globalization for Alaskan physical infrastructure investment, focusing on the use of smart growth principles to invest in place. Similar changes spurred by globalization also help to create an ideal environment for an innovative economy. The decentralization of political power and the increased local control and ownership of local economic resources allow more opportunities for officials to work with local stakeholders and choose investment in innovation over extraction. Globalization has also provided important access to global communication and information sharing systems, making it easier for small business to access international markets and for entrepreneurs to exchange best practices to support local development.

Investing in place through smart growth, as advocated in Chapter Three, helps to create an ideal built environment for creating a knowledge economy and fostering economic prosperity. By planning and building smarter, municipalities can reduce the cost of water and energy infrastructure and that of transportation maintenance. Smart growth is also proven to benefit household budgets by increasing property values, reducing transportation costs, and building affordable places to live that are interdependent parts of a strong, regional economy.

Local business that are an integral part of the overall regional economy likewise benefit from Complete Streets. Investing in walkable downtowns and robust public transportation systems increases foot travel for local buyers and helps attract and maintain talented, long-term workers.⁶⁹

As most smart growth occurs in cities, it is conducive that urbanization in the Arctic is rapidly accelerating. Over the past decade, urbanization has had just as an intense an impact on human development as has globalization. Despite the Arctic visual narrative of barren white icescapes, more than half of Alaskan residents now live in cities. Outmigration from rural communities towards more densely populated areas, net flows of immigration to the Arctic, and the emergence of “climigration” have all contributed to not only the magnitude and complexity of urbanization itself, but also the multifaceted challenges to human development in the Arctic.

In 1920, only 6 percent of Alaska’s population resided in urban areas. Today, that number is 66 percent, with 49 percent of all Alaskan Natives living in the five most-populous boroughs. While this is still far below the level of urbanization for the entire country, which currently stands at 82.4 percent, Alaska is unique in that 55 percent of the state population resides in just two cities – Fairbanks and Anchorage.⁷⁰

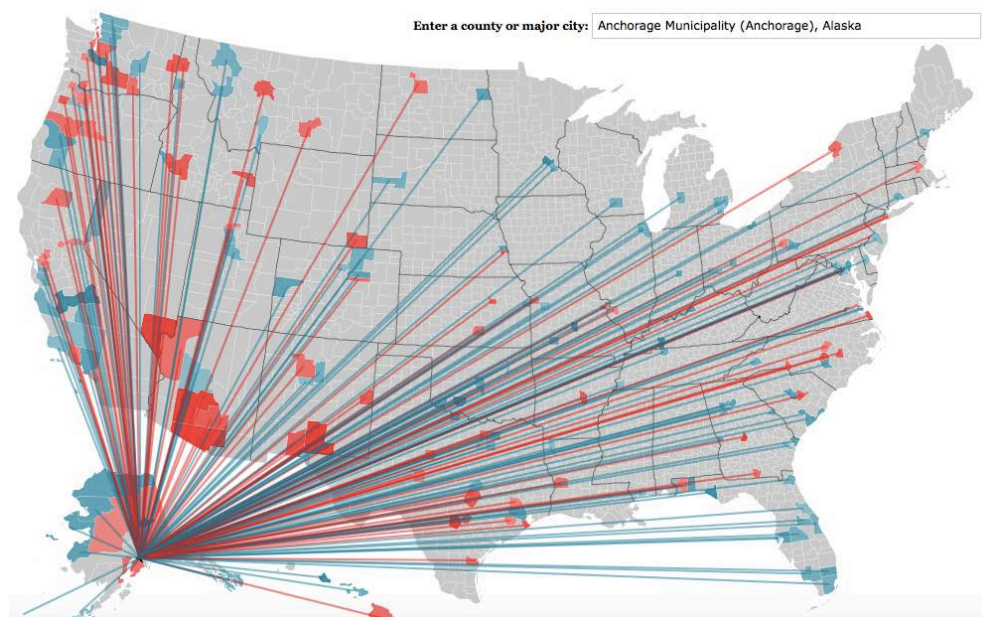
Like globalization, urbanization brings with it important political and social transformations that provide key underpinnings for innovation and entrepreneurship. Globally, economic activity is intensely concentrated in urban areas. While urban areas account for only 2 percent of the earth’s landmass, they are the source of the vast majority of global gross domestic product (GDP).⁷¹ Cities also provide a unique environment for developing adaptive economic growth policy. Unlike national governments, which often split economic policy-making authority among several branches of

Like globalization, urbanization brings with it important political and social transformations that provide key underpinnings for innovation and entrepreneurship.

government, city leaders often have both centralized executive power to act within their jurisdictions and some access to policy instruments needed to foster innovation and business in their cities. City mayors have a variety of economic tools to support creative industries, stimulate investment in local ventures, create a knowledgeable workforce, and ensure workers well being through public services.

In addition, because of more flexible governance structures, city leaders who confront budget and funding constraints, which are all too likely to persist in the coming decades, have the leeway to come up with creative responses. Creativity arises out of the municipal government's ability to champion change, engage the public more quickly, enact legislation, implement new programs, or create partnerships in shorter time frames and in more targeted ways. By contrast, financing proposals hatched by national governments, even sound ones, can be more easily hampered by politics and require a much longer time frame to build the bipartisan support necessary for passage. Cities, as nodes of opportunity and economic productivity, contain an added layer of diverse cultural capital creation, which is desired by a growing class of skilled workers.

2010 IN AND OUT MIGRATION FOR ANCHORAGE, ALASKA



The map above visualizes the moves to and from the Anchorage municipality in 2010 based on data from the US Internal Revenue Service. Counties that took in more migrants than they send are linked to Anchorage with red lines. Counties that sent more migrants than they took are linked with blue lines.

The trends of globalization and urbanization form an ideal frame within which economic innovation can occur. However, in order to use this frame effectively for local economic prosperity, Alaska must nurture and educate a skilled population that can create, share, and use knowledge. It must build economic and institutional regimes that provide incentives for investing in entrepreneurship. And it needs to advance an innovative system of firms, research centers, and other organizations that can facilitate the effective dissemination of best practices, tap into the global supply of knowledge, and adapt it to the Arctic.

UNLOCKING ENTREPRENEURSHIP THROUGH SOFT INFRASTRUCTURE

A knowledgeable and skilled workforce is the foundation of creating a strong local economy in Alaska. As education is a central pillar for both sustainable economic development and creating a sense of place and community, the fifth chapter in this report, *Investing in Communities*, will focus exclusively on education. *Investing in Communities* will bring the ideas presented in the chapters two and three together through a discussion of integrating schools into a knowledge-based economy and smart neighborhood design.

Beyond educated workers, Alaska must invest in regimes that provide incentives for entrepreneurship and the efficient use of existing and new knowledge. One layer of such a system is creating a strong reputation for commitment to investment in research development, creativity, and design. This could be achieved through local innovation grants, business tax benefits, and providing

A knowledgeable and skilled workforce is the foundation of creating a strong local economy in Alaska.

funding for fixed capital that benefits a knowledge-based, localized economy instead of infrastructure that support multinational extractive industries.

Alaska must finally create and support institutions that will create, exchange, and communicate new ideas effectively. Firms cluster in cities, creating an agglomeration effect that facilitates the spillover of knowledge between firms within and between sectors and reduces friction in matching labor market supply and demand.⁷² The cross-pollination of knowledge between

sectors translates into more opportunities to build knowledge capital. A result is that more innovation per capita is generated in metropolitan regions. Cities by their very nature provide agglomeration benefits and proximity that caters to the process of invention. Inventors thrive in places that can act as testing grounds for their experiments. Proximity offers a short feedback loop between inventor, competition, the market, and peers, and allows for rapid iteration and improvement.

The existence of Silicon Valley in the San Francisco Bay Area, the Raleigh-Durham-Chapel Hill research triangle in North Carolina, and the start-up technology and university community in Boston-Cambridge in Massachusetts illustrate the agglomeration effect and its positive impact on innovation. In January 2015 Norway's Minister of Foreign Affairs Børge Brende spoke about transforming the Norwegian Arctic into a "mini Silicon Valley."⁷³ He described a high north where the local economy was driven by invention and entrepreneurial initiative – an economy driven by human capital.

To help make this a reality, Norway has both Innovation Norway, a government initiative to support the development of local business, and Arctic Innovation Group, a team of investors that provide seed money for sustainable and profitable technology companies in Norway's Arctic.⁷⁴ Both have helped many small-scale entrepreneurial goods and services reach world markets and have contributed to improving Arctic standards of living. The programs give broad business support, financial provisions, and networking services to small enterprises.

Building the soft infrastructure like Innovation Norway and the Arctic Innovation Group could give urban Alaskans an opportunity to capitalize on their cities' assets and build their own local entrepreneurial economy. The program could provide strategic assistance and start-up financial support to Alaskans in the production of northern goods and services, partnered with successful American companies across the nation.

Cities also provide an ideal testing ground for new technologies developed there. Electric vehicles are one such technology that benefit from urban testing. Former Los Angeles Mayor Antonio Villaraigosa is aiming to turn his city into the “electric car capital of the world” with 80,000 EVs by 2015.⁷⁵ Charging stations have become commonplace at airports, businesses, freeway rest stops, and big-city parking garages, which total just over 1,800 statewide, or 21.6 percent of those in use across the United States. Free parking, access to restricted lanes, discounted tolls, and purchase subsidies are all successfully being pursued in cities pushing for more electric vehicle use.

By supporting initiatives to test northern innovation in Alaskan cities, policymakers can help to make a mini Silicon Valley in America's Arctic.

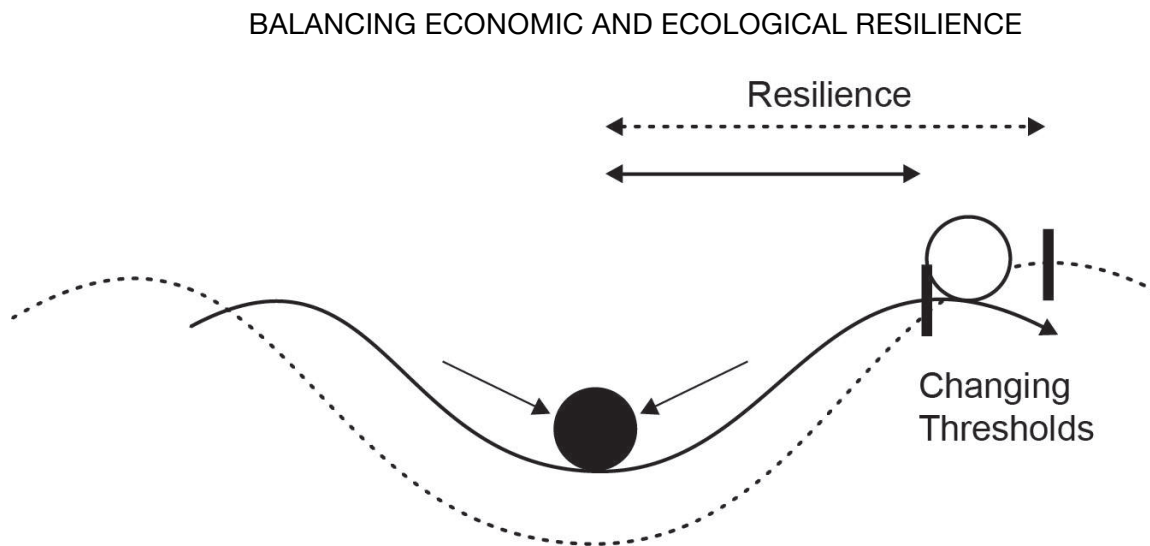
While not as large as Los Angeles' pilot program, electric vehicles are not only being tested, but are also being adapted by entrepreneurial northerners who are making them efficiently and economically cold-climate friendly. With over half of the state's population living in Fairbanks and Anchorage, these two urban areas provide an ideal setting to collect necessary baseline data on the local economic and demographic needs and to implement other small-scale programs that adapt successful design from the continental US to the Arctic region. By supporting initiatives to test northern innovation in Alaskan cities, policymakers can help to make a mini Silicon Valley in America's Arctic too.

INVENTING TECHNOLOGY AND DEVELOPING PRACTICE FOR CLIMATE CHANGE

Local innovations and the potential to invest in pilot programs make cities and even rural communities well poised to develop and disseminate technology and best practices for Arctic adaptation to climate change. Unlike nations, which often split decision-making authority among several branches of government, city leaders often have both centralized executive power to act within their jurisdictions and some access to the policy instruments and finances needed to test out locally developed ideas for climate adaptation. Cities can also adjust their governance structures and work horizontally across sectors more easily than national governments, allowing climate adaptation pilot programs to be more comprehensive and impactful. Short of an Arctic Council-wide policy initiative to support research, development, and implementation of climate adaptation in the north, local action holds the most promise to change the Arctic's resiliency paradigm.

City managers are charged with providing public services and have control over decisions on local-built environments. Therefore, officials can work with local entrepreneurs and a center for climate research and development to implement innovative adaptation plans that use technology and ideas developed in Alaska and founded on local knowledge.

For example, the Center for Arctic Technology in Sisimiut Greenland, affiliated with the Technical University of Denmark, educates Arctic engineers and carries out research testing in the field of Arctic technology developed there. It focuses primarily on energy efficiency and climate friendly technologies to reduce greenhouse gas emission but also to be resilient to climate change's impacts.⁷⁶ Currently, the center is piloting a low-energy house, experiments with wind power, and the setup of a solar heating system on Knud Rasmussens Folk High School.



Pursuing economic development with ecological sensitivity is often seen as a balancing act. A resilient system can cope with shocks and disturbances, like volatile oil prices and globalized markets, and keep its identity – symbolized as the solid ball in the center. In an unstable system, or when environmental and social changes shift the plain of interactions, a small disturbance can push the ball over a threshold.

Building centers of technology innovation and development in Alaska like the Center for Arctic Technology in Greenland, and working with local officials to implement their designs into communities through pilot programs can help cope with the impacts of climate change far beyond Alaska's state border. While local actions are typically reviewed individually, rendering them minimal relative to global need, innovative adaptation actions in Alaska are unique in that they can have a broad impact across the circumpolar north by providing an example for other Arctic communities on how to be resilient in the face of climate change.

A KICK IN THE GUT TO KICKSTART ALASKA'S ECONOMY

In the European Arctic, natural resource sector industries are responsible for less than twenty percent of economic output. This compares to more than sixty-three percent in the North American Arctic.⁷⁷ While homegrown innovation drives Nordic economies, the economy of the North American circumpolar region still relies heavily on extractive, multinational industries. Unlike local knowledge based economies that both profit from and create local human capital, large-scale resource production often brings the necessary capital, technological expertise, and labor from

outside the region. This means that much of the income generated by resource projects ultimately leaves the local economy, undermining the substrata of human development.

The decline in petroleum production and net costs of climate change provides the chance to sustainably reinvent Alaska's economy. Alaska must begin to invest in the commercialization of ideas in preparation for the not so distant future when resources can no longer support the wellbeing of its residents. Taking advantage of the political, economic, and social benefits of urbanization and globalization by investing in hard and soft infrastructure could spur more local economic innovation and augment the non-resource sectors of Alaska's economy.

But beyond building infrastructure, Alaska's economy today requires a new way of thinking about the challenges and social needs of a globalized Arctic population. The relationship between the globalized cities in which people live and the economic policies that govern their well-being must be rethought to highlight the mutual returns of their connection. The uncertainty of commodity prices, the net cost of climate change to resource development in the north, and the US chairmanship together provide the chance to change how planners and citizens alike think about local infrastructure projects, welfare policies, and the Arctic economy.

The relationship between globalized Arctic cities in which people live and the economic policies that govern their well-being must be rethought to highlight the mutual returns of their connection.

In response to President Obama's wildlife protection proposal, Senator Murkowski pledged that Alaska "will fight back with every resource at our disposal."⁷⁸ While the National Wildlife Refuge is projected to hold large petroleum reserves, the new Arctic Human Development Report makes it clear that there will be no 21st Century resource rush for Alaska.

Instead of seeing President Obama as an opponent, Alaska should see him as a partner in using the US Arctic Council Chairmanship to develop a strong, northern economy that capitalizes on urban innovation and local design. By investing in the infrastructure needed to support a non-resource economy – by investing in local innovation instead of extractive industry – Obama's environmental protection is not "a kick in the gut to Alaska's economy." It is an opportunity to rethink northern economic investment in order to allow Alaska to thrive for generations to come.

INVESTING IN COMMUNITY

The population of Alaska is projected to increase by 28 percent to 915,211 by 2035, nearly double the national population growth rate for the United States in the same period.⁷⁹ With lower infant mortality rates and better medical treatment for the elderly, the two biggest demographics poised to grow are the youngest and oldest sectors of Alaskan society.

And yet, through institutionalized social practices, the young and the old are isolated from one another now more than ever. By channeling youth into schools and expecting seniors to live a secluded home life or age-homogeneous retirement communities, these separate islands of activity have eroded the social support networks that once connected one generation to the next. This is

Channeling youth into schools has eroded the social support networks that once connected one generation to the next.

exceptionally true for the Alaskan Native population, 39 percent of which are under the age of 20. The generational exchange of traditional knowledge in these communities is fundamental to culture and wellbeing.⁸⁰ More generally, age-segregated strata create an environment that supports age discrimination, reinforces negative stereotypes, and eliminates opportunities for intergenerational understanding and dialogue.

The connections between one generation and the next are not only culturally important, but also economically. The intergenerational contract preserved in Alaska's economy today is one that favors the old at the expense of the young. As baby boomers live longer, there will be more older, non-working residents relying on the safety net, resulting in higher costs for social security, Medicare, and other programs.⁸¹ With current tax revenues insufficient to cover rising expenses, particularly in light of falling oil prices, the younger generation will be fraught with taking fiscal care of their elders.

Such budgetary deficiencies come at a time when crucial components of Alaska youth's development are under threat. The public education system is outdated, founded on inefficient funding models, and fail to take into account the varied factors that affect a student's ability to perform well. This results in some of the highest high school dropout rates in both the United States and across the Arctic region.⁸² Beyond education, childhood health is declining in the face of a rising obesity epidemic and increased mental health concerns. Free play, vital to the development of young minds, is stifled by limited public spaces. Without the support to develop active, educated, healthy children, Alaska will lack the human capital for the innovation-based economy advocated for in Chapter Four.

As Alaska's demographic shift deepens age segregation and accelerates the proliferation of interconnected, complex social issues, there is an immediate need to address the disengagement of generations in order to establish a foundation of trust and understanding upon which both the places in Chapter Three and the economy in Chapter Four are built.

A solution might come from the already successful school designs implemented across the country that have demonstrated an innovative way to connect the common needs of elderly and youth. Complete school buildings that re-conceptualize the relationship between education infrastructure and age inclusivity can equip northern youth with the knowledge of their elders necessary to make investments in human development long into Alaska's future.

RETHINKING INVESTMENT FOR A DEMOGRAPHIC SHIFT

The realities of the globalization, urbanization, and demographic shifts the Arctic currently faces require problems to be evaluated holistically, examining interrelated issues from varied sectors at different scales. Chapter Three, Investing in Place, argued for building physical infrastructure to create sustainable and enjoyable places to live in the north that capitalized on globalization while serving Alaskans and their local economy. Investing in Innovation, Chapter Four, supported the transition of Alaska's economy from resource development to a knowledge-based built upon the benefits of Arctic urbanization. But while complete streets, smart growth, and entrepreneurial institutions create the necessary physical infrastructure and innovative climate to foster sustainable business and livable spaces, there is still a need to invest in the communities that not only inhabit Alaska's economic and built environments, but also make them thrive.

Building a sense of community in cold places often happens indoors in shared, public spaces. Many architectural firms creating concept designs for relocated Arctic towns focus on building community through stylish public areas and green spaces, like the new town plan for the Swedish mining town Kiruna in Chapter Three. While these inventive designs are

important in their own right, many Arctic communities and cities cannot afford investing in entirely new community centers – especially in a time of uncertain natural resource production. Revamping already established public schools is one example of a more practical and economical, though still innovative, approach for Alaska to invest in communities.

Traditionally, schools are seen as a place for one section of the population – youth and those who formally teach them. But school buildings offer an opportunity to bring the sense of community, built in the streets in Chapter Three, indoors during Alaska's long winter months while simultaneously nurturing the education and creativity needed for the economy in Chapter Four. Complete schools promote social cohesion; create more opportunities for intergenerational interactions; foster healthier living environments with localized safety nets; and strengthen support systems for the development of students. Investing in communities through education designs can improve Alaska's wellbeing during a period of intense economic, social, and demographic change.

School buildings offer an opportunity to bring a sense of community indoors during Alaska's long winter months while simultaneously nurturing the education and creativity needed for a knowledge-based economy.

EDUCATION AND ALASKA'S BUILD ENVIRONMENT

Since the last Development Report in 2004, secondary education attainment has increased in all Arctic regions except Alaska. Only 68 percent of student in Alaska graduate high school, compared to the American national average of 81 percent. For Native Alaskans, that rate drops to only 42.5 percent.⁸³

There are a number of causes associated with high dropout rates. These include but are not limited to the need to babysit/lack of daycare, help (including financially and taking care of the elderly) around the home, and substance abuse. Cultural discontinuity, school culture, and parental attitudes towards formal education are also important factors.⁸⁴

While there have been efforts to change education curriculum to better suit the needs of northern

Only 68 percent of student in Alaska graduate high school, compared to the American national average of 81 percent. For Native Alaskans, that rate drops to only 42.5 percent.

communities, particularly the inclusion of Northern culture and traditional knowledge, these changes fail to recognize the intergenerational challenges of the problem in meeting not just the needs of students, but of those younger and older family members for which they must care. Improvement programs have heavily focused on education policy and curriculum development, overlooking the connection to community needed to support students outside the classroom and the built environment in which children learn.

There is a growing body of research that supports the connection between high-performing education and designing schools as centers of complete communities. While community-based design principles for school buildings have been adopted in state education departments and city school boards in the lower 48, their application to Arctic communities has not yet been explored. Despite this dearth in research, connecting education policy to school design could not only reduce dropout rates, but also produce co-benefits for traditional knowledge transfer, social cohesion, unemployment, and climate resiliency.

CREATING SCHOOLS AS INCLUSIVE COMMUNITY CENTERS

At their most basic level, school designs should include universal access and promote a healthy indoor environment for elders and children, paying close attention to lighting and air quality. Community school buildings should consider traffic patterns and adopt wider hallways, doors, and lighting principles that can positively affect student behavior and attitudes towards learning while diminishing potential areas for bullying and violence.⁸⁵

All stakeholders, not just school board officials and contractors, should be included in the process of designing so that it fits the community's needs. By investing in an attractive, well-designed and well-maintained center for the whole community, schools can become a place to facilitate respect, communication, and knowledge transfer between different generations.

In Gaylord Michigan, seniors have access to school gyms, health facilities, and cultural and

recreational activities held in classrooms and auditoriums. Gaylord High School in Gaylord, Michigan was built as a community center as well as a secondary education institution. It includes day care facilities, senior activities, and a community health care clinic to cater to young, old, and those in between. Classrooms were designed with the community in mind, creating multipurpose, flexible spaces with accessibility outside of regular school hours and the ability to adapt to the new needs of future community members.⁸⁶

High dropout rates often act as a problem-multiplier to other socio-economic concerns in the North. High suicide rates, unemployment, substance abuse, and intergenerational estrangement are all augmented by low graduation rates. Stunted traditional and formal education also acts as a threat-multiplier for climate change. It erodes the social and economic sustainability and capabilities of a community needed to be resilient in the face of ecological and climatic shifts.

REASONS FOR DROPPING OUT OF SCHOOL



Survey on barriers to high school completion among Inuit youth in Nunavut, Canada – a similar demographic to Alaskan Native Youth. Though the reasons for dropping out of school are varied, family obligations like babysitting, childcare, and taking care of elderly parents or grandparents are prominent in this word compilation.

The ability to transfer knowledge from older to future generations, to belong to a social network, to engage in a mixed economy in order to earn more income, and to actively participate in a healthy, vibrant community to increase longevity are all seriously affected by children not attending school. Building schools like Gaylord’s in Anchorage and Fairbanks that create schools as community centers can help Alaska’s demographic transition while simultaneously creating a more educated, capable workforce. As Michael Engel, an education researcher, notes, “Money for schools could be regarded not as consumption spending but as an investment in human resources that will pay off in the future.”⁸⁷

But building complete schools do more than foster communities, promote intergenerational respect, and produce an educated workforce; they can also generate co-benefits for Alaskan’s public health,

culture, and language preservation.

COMPLETE SCHOOL'S CO-BENEFITS TO YOUTH AND ELDERLY PUBLIC HEALTH

While the level of public health is immediately the result of access to quality medical facilities and personnel, human well-being is the result of a complex set of interactions among genetic, economic, social, cultural, political, and environmental actors. Consequently, climate change and the major human-centric trends discussed in this report – globalization, urbanization, and demographic shifts – generate the majority of emerging challenges and potential threats for the health of individuals and communities in the Arctic.

Alaska's youth and its seniors face a shared public health challenge in the changing diet of Arctic residents. Changes from more traditional foods, based on local hunting and fishing markets, to a

Alaska's youth and its seniors face a shared public health challenge in the changing diet of Arctic residents from climate change and globalization.

western type of diet has steadily increased in both cities and remote rural areas, and have negatively affected the health of indigenous communities.⁸⁸ Climate change impacts have had a negative effect on the health of animals harvested during fishing and hunting as well as the safety of storing community meat. Concurrently, transport costs for imported food from the lower 48 and Canada have remained high. This results in expensive grocery store produce and products, wherein healthy options from stores are out of reach of many family budgets. The Arctic Human Development Report notes that those Arctic residents who rely mainly on market foods are becoming increasingly dependent on cheaper, unhealthy choices.⁸⁹

Less-nutritious diets lead to increasing rates of modern diseases like obesity, diabetes, and cardiovascular disease.

The smart growth principles advocated for in Chapter Three, Investing in Place, can help reduce some of Alaska's emerging public health threats connected to diet. The risk of cardiovascular diseases, for example, is 11 percent less for those who actively commute, and students who live in walkable neighborhoods have a 59 percent lower chance of being obese.⁹⁰ Neighborhood design can strengthen public health policy aimed at reducing obesity by creating safe active transport options. Complete streets, designed to support biking and walking for all ages, and the compact design of smart growth, which makes walking and biking to goods, services, and social opportunities not only viable but pleasant, can provide the daily exercise needed to fight obesity and associated illnesses. Several communities across the country have already adopted or plan to adopt the use of smart streets and smart growth principles to fight childhood obesity, and promote healthy living generally.

Baldwin Park, a majority Latino-city near Los Angeles, used funding from the California Endowment and the Kaiser Permanente Community Health Program to create a program that connected public health policies with transportation infrastructure to combat childhood obesity.⁹¹ Adopted by its City Council in 2011, Baldwin Park is currently implementing one of America's most comprehensive Complete Street policies to transform five major corridors into safe walking and

biking options. Such designs and supportive policies can help to encourage healthier Alaskan communities through its built infrastructure.

Walkable design can be augmented with nutritional programming at complete schools to holistically promote healthy living. Including community kitchens, freezers, and gardens in schools can bring communities together to learn how to make wholesome cooking choices. The Council of Yukon First Nations include a number of suggested dietary programs in their Health Promotion Spring School's report.⁹² Providing community workshops on diabetes and grocery store choices, organizing cooking classes where elders teach youth and parents how to prepare nutritious meals, and hosting events that offer healthy food choices or center around garden harvests all bring community members together to support a healthful kitchen at home.

Many public health reports and policies focus on the younger generation, as they are often perceived as particularly vulnerable and in need of special attention as the pace of Arctic development increases. However, the Human Development Report highlights the greying of the population, the health needs of elderly people, many of whom are retired, to be a major emerging public health challenge.⁹³ There is much concern associated with the growing strains an aging population will have on the pension and health care system of Alaska – and for good reason. Nationally, the Congressional Budget Office reported that spending for Medicare and Medicaid accounted for 3 percent of GDP in 2009. By 2035, Medicare alone will increase to 8 percent. By 2080, 15. This national trend is mirrored in Alaska.⁹⁴

Aging in place instead of cost-intensive designated elderly or medical homes is one way to alleviate the economic difficulties of a growing older demographic sector while simultaneously promoting a healthier lifestyle for Alaskan elders. The benefits of schools as community centers and

smart growth design support aging in place. 78 percent of adults between the ages of 50 and 64 prefer to reside in their current residence as they age rather than move into a retirement community.⁹⁵ But aging in place requires built infrastructure, laws, policies, and programs to foster neighborhoods and community centers where residents can live safely, autonomously, and comfortably regardless of age or income. Many communities lack this necessary built and service substructure, forcing older adults to abandon their homes, friends, and communities in favor of assisted living complexes.

Smart growth provides housing at ground level or with elevators, wide hallways, communal green spaces, shared facilities, and goods and services within short walking or transit distances. Local programming at complete schools aims to reduce service fragmentation and create greater comfort and security for seniors through voluntary social work, education, socialization, nutrition and fitness programs, and legal advice. The Queens Community House's Neighborhood Intergenerational Chore and Errand Program connects school youth to seniors through services and social activities, which include shopping, laundry, and cooking, but also more costly needs like transportation and health care management.⁹⁶ Such programming helps neighborhoods thrive not only as senior-friendly communities, but also as places for families who provide labor for neighborhood facilities.

Aging in place instead of cost-intensive designated elderly homes can alleviate the economic difficulties of a growing older demographic sector while simultaneously promoting a healthier lifestyle for Alaskan elders.

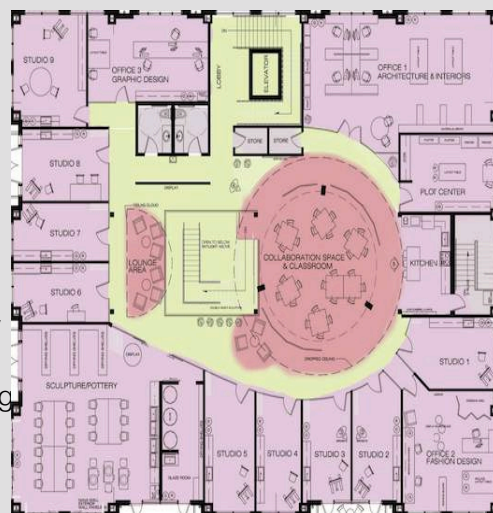
DESIGNING FULL-SERVICE COMMUNITY SCHOOL BUILDINGS

Quantitative and qualitative evaluations done by the Coalition for Community Schools makes it clear that community schools work. “In districts across America, community schools are improving student learning, strengthening families and schools, and building success stories provide services, supports, and opportunities that foster improved student learning, stronger families, and healthier communities. The Coalition’s analysis thoroughly covers services schools provide like primary health clinics and early childhood care; however, it neglects the built environment necessary for creating a one-stop community hub that meets a diverse set of needs.



The foundation of all school buildings that fully service students, families, and communities is mixture of dedicated and shared facilities. Classrooms, libraries, cafeterias, and sporting facilities can all be built or refurbished to accommodate different activities and age groups. Designing large, attractive classrooms with movable furniture can be used for education, senior programming, and community engagement. Open-plan gathering spaces offer another opportunity to include multipurpose room designs.

These spaces not only provides a lounge-like atmosphere for student collaboration, but also a comfortable, safe area to bring different community stakeholders together to nurture partnership building. Educators, families, community volunteers, youth development organizations, and business, health, and social agencies can use gathering spaces for both dedicated activities and collaborative programming that simultaneously addresses student and community needs. Engagement with community stakeholders throughout the development process is vital to ensuring that the building’s design is reflective of local, context-specific needs.



FOSTERING SAFE SPACES TO SHARE, LEARN, AND PRESERVE ALASKAN CULTURE

In an age of globalization and urbanization, now more than ever before Alaskans are exposed to and interact with different cultures and identities. Public places act as spaces where cultures are learned, negotiated, and transformed, which then creates the overall socio-economic environments and systems that dictate daily life and adaptation in the Arctic. Schools are perhaps the best example of such spaces of identity interaction. Classrooms have the ability to break barriers of ethnic, class, religious, and gender groups to promote an atmosphere of understanding and learning amongst an increasingly diverse Alaskan youth sector. The design of school buildings and community programs that are inclusive of all members of society provide the tools needed to translate that ability into an actuality.

Alaskan schools have a particular challenge of overcoming a colonial history of discrimination and racism against native peoples, the legacy of which can still be seen and felt today. Including native designs in school buildings that acknowledge the rich Native Alaskan past and aesthetics instead of relying on imported, pre-formulated school plans from the south is one way to be culturally inclusive. Another is through supporting and creating spaces for elders to speak to both native and non-native youth about cultural values and practices. Sharing traditional knowledge is vital in preserving history through memories from different viewpoints and in safeguarding a culturally rich future. This also includes the sharing and teaching of native languages.⁹⁷ The first Arctic Social Indicators report, a 2010 follow-up study to the original Arctic Human Development Report, identified “language retention” as the single best indicator of cultural vitality. Alaska ranks low in this indicator – all but one Native language had a lower portion of speakers in 2007 than in 1997.⁹⁸ The Inuit in the Eastern Canadian Arctic continue to keep native language retention at relatively high levels through the promotion of its use in schools and public programming. Building schools as complete communities that bring multiple generations together provides an opportunity to do the same in Alaska and ensure the survival of native culture.

Including native designs in school buildings that acknowledge the rich Native Alaskan past and aesthetics instead of relying on imported, pre-formulated school plans from the south is one way to be culturally inclusive.

In order to generate such health, cultural, economic, and educational benefits simultaneously, designing schools as indoor spaces of complete communities necessitates a multidisciplinary team. Educators, students, elders, public health workers, urban planners, community members, and financiers must work together to make the necessary investments in capital and ingenuity required for the transformation of schools from places of youth education into spaces of holistic human development in the Arctic.

TRADITIONAL KNOWLEDGE EXCHANGE FOR CLIMATE CHANGE ADAPTATION

Sharing traditional knowledge, practice, and language is not just a means of communicating individual experience; it is necessary to understand the human security threats from and adaptations needed for climate change. Increasingly, traditional knowledge is seen as an important component to climate change science in international negotiations and analyses. The Arctic Climate Impact Assessment report, a major international project of the Arctic Council in 2004 to evaluate and synthesize knowledge on climate change, places traditional knowledge and participation of indigenous peoples in climate adaptation on an equal basis with scientists and scientific knowledge.⁹⁹

Locally, the transfer of traditional knowledge from generation to generation is essential in supporting community adaptation and individual security in a changing environment. Elders can help youth to better understand safety when traveling or hunting, and how to protect themselves from variations in weather conditions, to changes in natural diets, and to the landscapes around them that play an important cultural role. Providing a physical space that brings elders and youth

The transfer of traditional knowledge from generation to generation is essential in supporting community adaptation and individual security in a changing environment.

together at complete schools can formally supporting the exchange of traditional knowledge for climate adaption. Curriculum development that involves elders and commentary after school programs that focus on learning from older members of the community can help to make Alaskan communities climate resilient.

The UNESCO Institute for Information Technologies in Education and the Inter-sectorial Platform on Climate Change Mitigation and Adaptation came together last year to launch an educational website for teachers and students in the Arctic that uses traditional knowledge to teach climate adaptations. ‘Climate Change Adaptations: Traditional Knowledge of Indigenous Peoples Inhabiting the Arctic and Far North’ uses Russian elder’s stories and environmental

awareness to create multimedia modules on how to best adapt to change in the climate and how to minimize the negative impacts of natural disasters for peoples of the high north.¹⁰⁰ One module, for example, focuses on the threat of avalanches in the territory of Petropavlovsk-Kamchatsky – there are ninety-five independent avalanche sites in the area. The modules include text, photographs, illustrations and videos sharing best practices, historical accounts, and personal knowledge of safety and security in the area.

Creating a physical space in Alaskan schools to replicate the virtual sharing of traditional knowledge on ‘Climate Change Adaptations’ between elders and youth has the added benefit of conversation – the ability to ask individual questions and share locally contextualized stores about their specific landscape. Intergenerational engagement builds climate resiliency, but also community trust, culture, and identity.

MULTIGENERATIONAL DESIGN FOR INTERGENERATIONAL COMMUNITIES

Today’s generational schism in Alaska requires an inventive solution that facilitates interpersonal trust, educational development, and societal accountability between young and old. The demographic shifts noted by the Development Report demand a new way of thinking that cultivates

a lifestyle founded on intergenerational respect and reliability, one that defines and conditions decisions that are mutually beneficial to all generations. Investment in the Arctic for the 21st Century must answer not just the tangible issues at hand, but must also address the deterioration of the very fibers that bind young and old communities together.

Following the smart growth design principles outlined in Chapter Three, establishing schools as centers of complete communities enables safe, equitable, and high-performing education in the north. Richard Rothstein, a top educational researcher, argues that, “two-thirds [of the quality of schools] is attributable to non-school factors.”¹⁰¹ Such out-of-classroom influences include neighborhood quality and safety, available and affordable transportation options, accessibility of after-school programs, open space, and community. Combining smart growth and complete schools creates the best environment for support youth development and education, which in turn fosters the creative, educated, and locally dedicated workforce necessary for the sustainable economy that was described in Chapter Four, Investing in Innovation.

Solutions like those advocated in this report that ameliorate several problems concurrently will increasingly become the most efficient and cost-effective norm for fostering more livable communities in an increasingly interconnected Arctic. Multidisciplinary problem solving for how we create places in the North can help to provide the physical environment that would make Alaska’s globalization, urbanization, generational transformations a triumph rather than a terror. By entwining complementary local policy and design that buttress adequate public health, decent public education, an innovative economy, and universal accessibility, Alaska will be better prepared to confront its most immediate challenges to human development.

The future of the north will be determined by the choices of the youth and their aspirations and priorities – where, and what they choose to study, live, and work. Those choices, however, will be shaped by the infrastructure, economy, and society Alaska creates today. Investing in community can provide the opportunities for leaders of today and of tomorrow to make the ultimate investment – that of environmentally sustainable and human-centric development for the Arctic.

POLICY RECOMMENDATIONS

In May 2013, the White House released America's *National Strategy for the Arctic Region*, an eleven-page document outlining a strategic vision for US Arctic policy. Acknowledging that an ecologically changing Arctic is of geopolitical importance to the federal government, the *National Strategy* highlighted three major lines of effort: (i) advancing US security interests; (ii) pursuing responsible Arctic region stewardship; and (iii) strengthening international cooperation. The *Strategy* rests on a foundation of environmental protection, responsible resource development, and utilizing scientific research and traditional knowledge. Taken together, these three pillars aim to support a collaborative and innovative approach to integrated Arctic management. The 2013 Strategy set forth a plan to proactively coordinate regional development and environmental stewardship by uniting Federal activities, partnering with local stakeholders, and working with other Arctic nations.

The following year, in 2014, the White House released the *Implementation Plan for The National Strategy for the Arctic Region*. The plan reiterated the three lines of effort, and buttressed them with key areas to promote, improve, and understand a changing circumpolar region. It provides the methodology, process, and approach for executing the Strategy. Using US security interests, environmental stewardship, and international cooperation as guiding principles, the plan includes specific activities, supported by programs overseen by Federal entities, to accomplish the Strategy's vision.

Creating a national vision and identifying areas of strategic interest is an important foundation to establish. Visions provide the common, universal goals or outcomes that can coordinate many actors working at different levels. Establishing key priorities for social, economic, and environmental outcomes can ensure that intended impacts are met. The White House's proposed strategy has the ability to reset the conventional, oftentimes neglect of the Arctic region and push policy in a new, proactive direction.

But the establishment of this national vision is not enough. The guiding principles set forth by the White House Strategy are heavily focused on investments that benefit those living outside of the Arctic Circle. Legally preserving the freedom of the seas, building icebreakers, and providing for future US energy security are all important goals to be met over the next two years. However, the national government must recognize that over 730,000 of its citizens live in Alaska, and that any national strategy to benefit the Arctic requires policies that produce positive returns for US Arctic citizens. In order to yield local benefits, the White House must expand the extent of evolving Arctic infrastructure and strategic capabilities. Rather than focusing on benefits to those who pass through the Arctic region, Arctic infrastructure must include human-oriented development, entrepreneurial promotion, and inclusive education engagement through investments in place, innovation, and community.

In order for the goals set forth in both this report and the White House directive to be realized, the national government needs to add capacity at all levels, starting with federal institutions, to carry out the vision. Policy makers must first organize and strengthen authority at the national level to coordinate actors across America's multi-level governing system to guide Arctic investment in an integrated fashion. Then, the national government must work to build local capabilities to implement projects and programs that promote the guiding principles laid out in the *National Strategy* by making funding opportunities available.

The enthusiasm and increased activity surrounding the upcoming US Chairmanship of the Arctic Council provides the momentum to realize the White House's strategic vision through building capacity for and investing in human development. By working with local stakeholders to create proactive Arctic infrastructure selection, development, and funding schemes, America can show leadership across the circumpolar north by empowering Alaskan communities.

CREATE A CLEAR, INCLUSIVE DECISION MAKING BODY

There currently exist plans to establish both a White House steering committee and a senate caucus to shape priorities, oversee implementation, and push for Arctic investment. In January 2015, President Obama signed *Executive Order --- Enhancing Coordination of National Efforts in the Arctic*. The Order establishes an Arctic Executive Steering Committee to provide guidance to executive departments and agencies. The committee will enhance coordination of Arctic policies across the federal government. It includes the Deputy Secretaries of State, Defense, Justice, Interior, Agriculture, Commerce, Labor, Health and Human Services, Transportation, Energy, and Homeland Security. Membership also consists of representatives from the Environmental Protection Agency, National Intelligence, the National Aeronautics and Space Administration, the National Science Foundation, the Arctic Research Commission, the Office of Management and Budget, and a number of assistants to the President. The aim of the Steering Committee is to establish a strategic direction for all federal action regarding the Arctic region. It promises to be inclusive and multidisciplinary in its work towards prioritizing the Arctic in the executive branch.

The federal government must effectively integrate the work and priorities of federal departments with activities that are already underway in the State of Alaska and in local communities.

In Congress, Senator Lisa Murkowski of Alaska and Senator Angus King of Maine announced that they were forming an Arctic caucus to promote US leadership in the region. The objective of the caucus is to build out polar policy initiatives in defense, energy, environment, and trade. Unlike the appointment of Admiral Papp as the US Special Representative to the Arctic, the new caucus provides a legally empowered body to draft and enact laws that can redefine investment in the north. It also provides an opportunity to pursue innovative arrangements to include input and work together with other federal and sub-national authorities.

But Arctic policy is multi-scalar by its nature. It touches on local challenges of public health, economic prosperity, cultural vitality, and ecological sustainability. The Department of State, the

White House, Congress, and a handful of national department and agencies all have a stake in what happens at the top of the world. But it is not just policymakers at the federal level that hold a vested interest in meeting nationally set strategic goals for the circumpolar north. The State of Alaska, local leaders, the private sector, Alaska Natives, non-governmental organizations, researchers, and international actors also hold relevance and power to make a meaningful difference in how the Arctic is developed

Therefore, policymakers at the national level cannot be the only actors involved in reformulating Arctic investment. The past four decades have seen a continual increase in re-allocating economic and political decision-making to northern stakeholders. Admiral Papp, Secretary Kerry, and others in Washington must work together with a multi-level team to make policy on how to best support human development.

National leaders need to work to organize and strengthen institutional authority at the regional and local levels to further their strategic aims. They must effectively integrate the work and priorities of federal departments with activities that are already underway in the State of Alaska and in local communities. In particular, policymakers must partner and coordinate with Alaska Natives in a way that recognizes tribal government's unique legal relationship with the US and provide significant opportunities to inform policy affecting indigenous communities.

The Senate Energy and Natural Resources Committee meeting, "United States Arctic Opportunities Hearing," held on March 5, 2015 provided a glimpse into the positive returns of a multidisciplinary, multi-scalar discussion. In addition to US Senators, the hearing also included Special Representative Papp, Mayor Charlotte Brower of the North Slope Borough, Representative Bob Herron of the Alaska State Legislature, Professor Cecilia Bitz of the University of Washington, and Mr. Patrick Arnold, Director of Operations and Business Development at the Main Port Authority. Bringing together leaders from the federal, state, and local levels of government is necessary for creating policies that address local needs and meet national aims simultaneously. While the March 5 Senate Hearing was an encouraging start, the Arctic caucus will need to continue its relationship with sub-national, academic, and private sector actors to produce inclusive legislation.

The Executive Order also highlights the need to engage with the State of Alaska, Alaska Native Tribal Governments, and other US stakeholders. It aims to establish a transparent process to improve coordination and sharing of information with stakeholders at all levels, inclusive of the private and nonprofit sectors. The Order calls for establishing appropriate Federal entities to be the point of contact for Arctic matters with Alaska and Alaska Native tribal governments. It also mandates the invitation of academic and research intuitions to consult on issues or participate in discussions on Arctic issues. Powerful language that obligates the Steering Committee to engage with non-federal actors is necessary for developing sound Arctic policy – but it must be met with tangible application.

Creating participatory process that include a diverse set of voices to represent all relevant actors and forms of knowledge is vital to making resilient investment in and policy for the Arctic. By ensuring that clauses are realized and continuing to bring together stakeholders from all levels, these two federal groups can take the lead on fostering a comprehensive policymaking process for the US Chairmanship.

ESTABLISH INNOVATIVE INFRASTRUCTURE SELECTION SCHEMES

In Alaska, policymakers and practitioners are rushing to keep up with the new demands of globalization, climate change, urbanization, and demographic shifts. Although managing and implementing projects happens at the local level, national Arctic policy can play a critical role in supporting and guiding coordination amongst national strategic goals, design of the projects, and their funding and financing throughout the development, selection, and evaluation process.

THE NEED FOR BASELINE DATA

In March 2015 the White House released a report to describe the implementation progress thus far of the National Strategy for the Arctic Region. It focused on the activities over the past year that have advanced the three lines of effort outlined in the Strategy, namely i) advance United States security interests; ii) pursue responsible Arctic region stewardship; and iii) strengthen international cooperation.

The two key accomplishments of the federal government, in coordination with the State of Alaska and Alaska Natives, over the past year are the appointment of Admiral Robert Papp as the US Special Representative for the Arctic Region and the release of the Executive Order on Enhancing Coordination of National Effort in the Arctic. The Report details the establishment of an Arctic Executive Steering Committee as the most immediate next step to the implementation of the Strategy.

Beyond leadership appointments to provide guidance and enhance coordination between stakeholders, the federal government has also invested in Arctic physical and social science research. Agencies, departments, administrations, and various other groups across the federal government have used this past year to collect, analyze, and publish Arctic data. The topics of these research initiatives include but are not limited to maritime traffic, aviation safety, telecommunication infrastructure, oil spill prevention, climate change, biodiversity, and expanding international cooperation.

These assessment and analytical reports are important in establishing baseline data upon which all other activities will build. Baseline data underpins all stages of investing in circumpolar projects and policies. In selection and development of projects, baseline data is used to decide what investments will be the most impactful for human development. Once a project is completed, baseline data is used again in evaluation and monitoring of the project outputs and impacts. While more still needs to be done, the progress report shows a commitment by the federal government to create a foundation of information and political leadership for its two years as Arctic Council Chair.

With a national vision and strategic priorities for Arctic development already set, policymakers, led by an inclusive Arctic caucus, require guidance to refocus polar investment towards projects that support human development. Supporting such projects requires a fundamental shift in infrastructure selection and development that clearly prioritizes people over resources. Rather than human development being a consequential requirement of resource extraction, investing in northern residents' wellbeing should be established as an important parameter at the planning stage. Creating

a set of guidelines is necessary to connect local execution to broad policy goals. Guidelines can direct funding towards projects that invest in place, innovation, and community that help to meet White House aims while simultaneously fortifying the resiliency of Alaska.

Planning and design procedures that set standards for local infrastructure proposals can push Arctic investments at the local, state, and national level towards projects with long-term economic, environmental, and social sustainability. Language employed in the guidelines must set broad parameters by which all US Arctic actors can respond to appropriately. Creating national benchmarks for thoughtful investment in the Arctic can ensure that projects meet long-term goals

Creating a set of guidelines is necessary to connect local execution to broad policy goals.

and fit into government initiatives, like climate change and national energy policy. National guidelines could induce more human-oriented indicators that support social, economic, and ecological wellbeing. Including national thresholds for co-benefits as selection criteria can prioritize place, innovation, and community in the selection process. Co-benefits, those that indirectly result from projects, could include reduction in greenhouse gases, individual safety, and cultural enhancement. Including concrete benchmarks in selection guidelines for equity, universal access, environmental impacts, cultural

sensitivity, and local economic stimulation can help to prioritize human development over infrastructure that profits extractive activities. Smart growth projects, complete school buildings, and investments in fostering local entrepreneurship would all benefit from a shift in selection guidance.

Providing recommendations for local cost-benefit analysis criteria based on the federal Arctic Strategy can prove a successful method in marrying national goals with local context for project selection. Cost-benefit analyses provide consistency and transparency in decisions and strategic project choices. They allow for a comprehensive assessment that aligns local needs with federal targets by including user benefits, local impacts, and external costs to society. Producing locally generated cost-benefit analyses that consider broad federal goals and community impacts could even be used to bypass federal funding bureaucracy and streamline funding processes.

Any selection scheme enacted should use baseline data from already existing sources of research in natural science, social science, and traditional knowledge, like the US Arctic Research Commission, to underpin measuring efforts. Sound baseline data is not only vital in project selection; it also plays a key role for development, evaluation, and subsequent improvement. Baseline data that is inclusive of many disciplines and ways of knowing permits selection and evaluation to be comprehensive and consistent. Such evaluations have the ability to include less tangible measurements of success like quality of life, environmental impacts, equity, and social cohesiveness. Indicators for both selection and evaluation should be flexible, and should be able to be modified to reflect the values, needs, and conditions of a particular locality's challenges.

PROVIDE MORE FEDERAL FUNDING OPPORTUNITIES

In order for human development and the White House's goals to be realized, bodies like the Arctic caucus and White House Steering Committee must create federal funding opportunities to support human-centered infrastructure and local capacity building. This means both allocating part of the national budget to evolve Arctic infrastructure but also connecting Arctic projects with other

funding sources. With the White House prioritizing the Arctic as a strategically important region, it stands to follow that the Office of Management and Budget should support and endorse the dedication of new money, or the reallocation of a significant portion of existing funds, to Arctic activity. In order for Congress to appropriate the needed funds for the Arctic, the President must express his desire for federal funds to provide appropriate Arctic capacity and capability through his budget request.

Despite the anticipation surrounding the Arctic melt and the political excitement over the US Chairmanship, the federal government has not yet come to terms with the budgetary implications of investing in development and security initiatives.

There currently exists no parallel national budget allocation to match the White House directives, steering committee, or senate activity. The federal government allocates some funds for scientific and social science research of the Arctic at NOAA, NASA, the National Science Foundation, and the Arctic Research Council. However, little has been allocated to increase Arctic capabilities.

The press release for the *U.S. Navy Arctic Roadmap 2014-2030* states, “With shrinking budgets and growing mission requirements elsewhere, particularly the Pacific, the service has little appetite for new tasks, experts say, especially ones that are decades away and where threats remain speculative.” The idea of distant challenges and opportunities from a changing Arctic influence not only America’s security investments, but also many budgetary proposals for polar development and infrastructure.

But challenges of climate change, amplified by urbanization, globalization, and demographic shifts, are affecting residents of the Arctic today. Budgetary submissions for human-oriented development cannot wait. The President’s Steering Committee on the Arctic region must request significant funds from congress, directed at the newly established Arctic caucus, for fiscal year 2016 to support human development in Alaska.

While requesting new funds is important, the current environment of permanent budget austerity in the United States congressional budget debates requires identifying alternative funding and financing opportunities. The Steering Committee, with representatives from all major national departments, can connect infrastructure projects in Alaska to funding opportunities across federal departments, agencies, and commissions. The TIGER Discretionary Grants within the Department of Transportation provide one option for alternative federal funding opportunities. The grants “provide a unique opportunity for the DOT to invest in road, rail, transit, and port projects that promise to achieve critical national objectives.” The fund has received more than \$4.1 billion since 2009 from Congress for six rounds of competition. Since its inception, localities in Alaska have won four projects. Cities, villages, and federally recognized tribes have been able to resurface roads, reconstruct streets, build loading facilities, and develop a master plan for a port with TIGER money. Assisting Arctic communities to find, apply, and receive funds for local development plans through already existing federal pools of money like TIGER can provide financial resources despite budget austerity.

Bodies like the Arctic caucus and White House Steering Committee must both allocate part of the national budget to evolve Arctic infrastructure and connect Arctic projects with already existing funding sources.

The private sector could also provide another source of financing for human-oriented development projects. Currently, private investment in the Arctic is deeply focused on natural resource extraction and shipping to southern ports. There exists a gap of financing when it comes to infrastructure and business ventures that prioritize benefit to Arctic residents. This, at least in part, is due to the high risks incurred by uncertainty around the environmental changes in the Arctic, but also from sparse populations and limited local markets. Creating a strong reputation for government commitment to investment in research development, regulatory consistency, and technical support for peoples of the North can provide incentives for private sector investment to contribute to human development.

Public private partnerships for human-oriented infrastructure could supplement government funding for projects. Public private partnerships (PPPs) require institutional arrangements and local government capacity for successful results. PPPs currently exist in natural resource extraction and shipping infrastructure, and can be enhanced to include non-recourse dependent development. Sweden and Finland have used PPPs with ice management vessels, where the government employs vessels in the winter and the same vessels are used in the summer for private hydrocarbon projects. For PPPs to be effective, the government must work to establish clear and transparent procedures for capital cost sharing and management.

Globally, investment in the Arctic could reach \$100 billion over the next decade, and, by one estimate by the International Energy Agency, as much as \$20 trillion by 2038. As the US federal government allocates funding to the development of strategic infrastructure for shipping and resource development, it must ensure that financial resources also support the wellbeing of Alaskan residents.

AUGMENT HUMAN CAPITAL AND CAPACITY

At its foundation, human development relies on human capital for success. Financial investment and project planning will only be effective at supporting Alaskan communities' social and economic wellbeing if there exists high local capacity to implement and thrive in an updated built environment.

Establishing an innovation program for the American Arctic that provides business and technical support for local entrepreneurship can augment human capital for a resilient local economy.

The White House Steering Committee and the Arctic caucus can augment Alaska's human capital and capacity by making budgetary proposals to invest in constructing schools that build inclusive communities for long-term resiliency. As argued earlier in this report, revamping schools offer an opportunity to build a sense of community amongst Alaska's various demographic groups. It also nurtures the

education and creativity needed for an innovative economy. Complete schools promote intergenerational social cohesion; foster healthier living environments with localized safety nets; and strengthen support system for the development of students. Investing in education design can secure Alaska's current and future welfare during a period of intense economic, social, and

demographic change.

Beyond public school buildings, federal Arctic policymakers should also invest in building human capital in post-secondary degrees. President Obama's current proposal to provide free community college education could help reduce the inequality gap in America. However, Alaskans – particularly Native Alaskans – living in remote communities would face great physical and financial difficulty in traveling to one of the seven community colleges in the state. Long distances and extreme weather make high school and college difficult to attend throughout the Arctic, and often result in high drop out rates and a poorly educated workforce. Investing in free virtual community college courses and the telecommunication infrastructure for residents to access them could significantly lower drop out rates, provide an educated workforce, and inspire students towards pursuing a variety of careers that would diversify the Arctic economy. Investing in telecommunication infrastructure in the Arctic is already a priority of the White House, but is mostly focused on national security interests and shipping. By expanding the goal of developing communication infrastructure to include opportunities for virtual schooling, Alaska could foster the local capacity for human development and a thriving, diverse Arctic economy.

Establishing an innovation program for the American Arctic akin to Innovation Norway that provides business and technical support for local entrepreneurship can augment human capital for a resilient local economy. Creating a business in the Arctic comes with a set of unique challenges. Energy costs are high, logistics can become unwieldy, and shipping costs can make attempts of global, or even national, scale-up prohibitively expensive. Entrepreneurship in the north requires determination and flexibility – qualities that many northern ventures already exhibit. They also need loans, startup capital, and technical support that allow them to participate in Arctic development in a way that respects the environmental and traditional lifestyles. Technical support could include help in developing venture plans, access to technology and baseline information, and connecting ventures with funding and financing opportunities. Fostering global peer-to-peer sharing of knowledge by creating institutional exchanges and accelerating the dissemination of best practices can enhance formal technical capacity building efforts.

As a concluding note to his executive order on arctic policy, President Obama noted that, “The Arctic is changing. We must proceed, cognizant of what we must do now, and consistent with our principles and goals for the future.” There is a need to move past the symbolic action of appointing special representatives and employing rousing rhetoric to concrete commitments in developing Arctic infrastructure. Setting priorities for selection and development, creating flexible funding, and building local capacity can safeguard Alaska's wellbeing for today and for the future.

THE POLAR CENTURY

In April 2015, the United States will take on the Arctic Council Chairmanship for the first time since early 2000. Much has changed over the course of the past fifteen years in America's Arctic. Alaska has gone through rapid political, social, and economic globalization that has touched even the most geographically remote communities. Urbanization has brought over half of the state's population to just two major cities that have developed considerable built infrastructure in the last decade. Oil production has seen a steady decline, with many ups and downs in revenue generation for the state and its inhabitants – the most recent of which has left Alaska in a severe budget shortfall. And, perhaps most noticeably from a southern viewpoint, climate change has and continues to transform the natural landscape and influence decisions for Arctic development and governance.

This new Arctic of the 21st Century demands a Chairmanship that is forward thinking, collaborative, and flexible to the challenges and opportunities of a constantly evolving circumpolar region. As Chair, the United States must guide the Council as a respectful partner of not just other Arctic states, but also as a partner to local stakeholders who live, work, and thrive in the high north. Such a partnership necessitates measured policy decisions that both take local priorities into consideration and meet national and international goals set forth by America and the Arctic Council respectively.

The Arctic of the 21st Century demands a Chairmanship that is forward thinking, collaborative, and flexible to the challenges and opportunities of a constantly evolving circumpolar region.

At present, a strain exists between state and national Arctic stakeholders in America. While state priorities reflect the local realities of a weakening oil economy and inadequate welfare infrastructure, those in Washington are focusing on the macro-picture of climate change ahead of the much-anticipated United Nations Conference in Paris later this year. As Alaskan leaders struggle to make up the \$3.5 billion shortfall that will effect education, public health, and welfare services, unilateral federal action like President Obama's proposal to further restrict drilling in the Arctic National Wildlife Refuge only serve to intensify this tension.

Building infrastructure for human development in Alaska provides a common ground for both levels of government to act. Investing in human development fosters sustainable, healthy, and economically productive communities while simultaneously addressing climate adaptation and mitigation. Smart growth and complete street principles can create low-carbon, climate resilient places that focus on livability and community contentment. Supporting entrepreneurship through

research development centers and programs offering business support can provide the locally developed technology to make smart growth and adaptation strategies effective for a northern climate. Building schools as centers of complete communities can develop the social capital necessary for a knowledge-base economy, but also work towards preserving the rich cultural identities of Alaska. Taken together, the soft and hard infrastructure of smart growth, entrepreneurship, and complete schools deliver a strong, multi-level agenda of Arctic development for America's chairmanship.

Far from the pristine, uninhabited images of wide expanses of tundra that have captivated the human imagination since 18th Century exploration, the Arctic is very much alive with vibrant communities, economic growth, and inventive governance regimes. It is anything but the static tabula rasa that Franklin and Scott set forth to conquer and colonize – it is source of employment; it is an identity; it is a integral part of the globe's ecological, economic, and social systems; it is a source of pride and political empowerment; and, above all, it is a homeland.

In a number of speeches and interviews, Admiral Papp has expressed his intent to promote an appreciation amongst Americans that the United States is an Arctic Nation. Through educational programming and publicizing of forthcoming policy, he hopes to transform the Arctic narrative of polar bears and ice most people hold into one that celebrates its dynamism and innovation but also acknowledges its challenges and shortcomings.

Promoting a shift in the southern narrative of how Americans view the Arctic through policy is important, but so too is advancing a shift in how those same policymakers conceptualize investment for the north. Transforming economic development into human development can accomplish both. It can support a change in policy perspective but also show the lower 48 that there are fellow Americans living in the Arctic that, like them, face modern challenges and opportunities. As Admiral Papp says, the United States is an Arctic nation today. Investing in place, in innovation, and in community – investing in people – will ensure that America stays an Arctic nation long after it completes its upcoming two-year run as the Chair of the Arctic Council.

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The Arctic Institute | Center for Circumpolar Security Studies

The Arctic Institute | Center for Circumpolar Security Studies

P.O. Box 32175

Washington, DC 20007

+1.202.656.6258

www.thearcticinstitute.org

info@thearcticinstitute.org