

Recommendations and Criteria for Using Federal Public-Private Partnerships to Support Critical U.S. Arctic Maritime Infrastructure

National Strategy for the Arctic Region Implementation Plan Task 1.1.3

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Prepared By

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Arctic Marine Transportation Integrated Action Team

For the

U.S. Department of Transportation

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- U.S. Coast Guard
- Maritime Administration
- Bureau of Ocean Energy Management
- Bureau of Safety and Environmental Enforcement
- Environmental Protection Agency
- Federal Aviation Administration
- National Maritime Intelligence-Integration Office
- National Telecommunications and Information Administration
- U.S. Army Corps of Engineers
- U.S. Department of Energy
- U.S. Department of State
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- U.S. Department of Treasury
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- U.S. Transportation Command
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EXECUTIVE SUMMARY

The U.S. Committee on the Marine Transportation System (CMTS) is a Federal Cabinet-level, inter-departmental committee chaired by the Secretary of Transportation. In 2010, the CMTS was directed by statute to coordinate the establishment of domestic transportation policy to ensure safe and secure maritime shipping in the Arctic. The January 2014 National Strategy for the Arctic Region (NSAR) Implementation Plan (IP) directed the U.S. Department of Transportation to execute three tasks under the objective *Prepare for Increased Activity in the Maritime Domain*. These tasks were delegated to the CMTS by the Office of the Secretary of Transportation in May 2014.

This third NSAR IP action report by the CMTS fulfills Action 1.1.3 to “Develop recommendations for pursuing Federal public-private partnerships in support of the needs assessment and identified prioritized activities.” Action 1.1.3, draws upon existing products developed by the CMTS, independently by CMTS participating member Federal agencies, published reports from outside the Federal government, and outreach with Arctic stakeholders and tribal representatives. These sources were used to develop the recommendations for use of public-private partnerships (P3s) in developing, improving, and maintaining infrastructure in support of Federal maritime Arctic activities, national security, navigation safety, and stewardship of natural resources.

The recommendations in this report are presented in the order in which they generally appear in the text. They are not ranked in any particular order and serve to reinforce the overarching recommendation that P3s are a powerful tool with many opportunities for application in the Arctic. Application of traditional and non-traditional P3 arrangements could serve as a significant source of funding for Arctic maritime transportation needs as well as community and economic development needs. As mentioned in the text, strict interpretations of financial and financing arrangements are not always appropriate, particularly for a region as unique as the Arctic. The following 19 recommendations should be used to help guide the planning process for Federal departments and agencies as well as for communities and industry who are interested in exploring the possibilities P3 may offer for their infrastructure priorities.

1. Federal agencies should work closely with state, local, and tribal governments and the private sector, including Alaska native corporations, to ensure policies maximize overall investment in and adoption of services
2. Federal agencies should work together to create a policy environment conducive for developing holistic innovative financing guidelines that could be applied consistently across the Federal government.

3. Flexibility in determining the national economic benefits of development in Alaska, one of the barriers to any successful P3, may provide an avenue to pursue non-traditional financing and investment arrangements, previously unavailable in the region.
4. Explore whether land use rights and/or land ownership can be leveraged for infrastructure development (e.g. publicly owned land leased and used for private development) as part of a P3 arrangement.
5. There are a variety of potential options and ingenuity for financing, land acquisition, and economic justification that should be explored to the fullest extent possible to identify any collaborative opportunity where P3 or non-traditional financing could be applicable to development of port infrastructure.
6. A regional ship waste management strategy could include a regional reception facility plan which could take advantage of formal or informal agreements, including near-Arctic waters facilities. The benefits of which may include minimizing the risks associated with waste disposal facilities located in remote regions or only seasonally operational and sharing of waste management resources, infrastructure costs, and maintenance costs.
7. Explore potential financing partnerships that would be regionally based and, depending on the locations included in the agreements, include facilities that are available year-round as well as seasonally, thus minimizing risks and maximizing potential users.
8. Leverage existing programs and find ways to adapt them to the infrastructure needs of Arctic communities may provide a first step toward ensuring infrastructure exists to expand the maritime capabilities.
9. Combine the benefits of grant and finance programs to provide more flexibility for small communities to increase their infrastructure stability and energy security and grow their maritime economies.
10. Work to identify private partners and stakeholders who can provide the capital and the freight to submit for Marine Highway Project funding to cover infrastructure deficits.
11. Review Alaska airport locations that would be considered critical infrastructure nodes during an emergency response situation and explore the possibility of using the FAA Airport Privatization Pilot Program or similar to ensure that airport infrastructure is sufficient to support a large scale response.
12. Identify opportunities for research and development (R&D) cooperative projects which could leverage both the needs of the Government and communities with the talents and funding of private industry. Identify opportunities where known technology gaps can be leveraged through investment partnerships that are then able to market the resulting

products back to governments and the private sector potentially providing an opportunity for the return on the investment needed to get critical technology to market.

13. Utilize programs like Arctic Oil Spill Response Research (OSRR) to build the base for technology development, demonstration, and staging/deployment which could take the form of P3 or similar financing arrangements.
14. Support the use and expansion of predevelopment fund for cutting-edge projects to provide seed capital for regional collaboration models such as regional infrastructure exchanges and set up an Arctic-region infrastructure exchange.
15. Expand access to predevelopment funding for infrastructure projects, and identify opportunities for connecting state and local-based projects with complementary Federal predevelopment resources.
16. Explore non-traditional P3 structures such as subsidy payments, analogous to an availability payment, which includes specific service requirements and accountability that need to be maintained in order to receive the funding. This would include developing a methodology to compare the costs of firms applying for the subsidy payments to the average cost of “similarly situated” firms.
17. Identify and explore programs that are designed to encourage financial institutions to channel their resources to underserved, low income, or non-metropolitan communities in order to help improve the economic resilience and incomes of these communities. Under these programs, financial institutions would have increased incentives to lend to or invest in P3s that are involved with building or rehabilitating communications infrastructure.
18. Identify projects and partnerships where the construction, operations and maintenance, and financing costs of new or rehabilitated infrastructure and services in Arctic coastal communities could potentially be shared by direct payments from local residential/business customers, Federal subsidy-availability payments, as well as payments from by maritime assets (vessels and oil rigs) that would benefit from having access to the asset.
19. Identify alternative P3 incentive structures that can potentially align public and private sector interests in infrastructure provision and management by having both partners share in the project’s downside risk as well as the upside potential.

Infrastructure investment is vital for economic growth and prosperity in the Arctic, especially given the significant infrastructure gaps currently faced. P3s represent a promising approach that can leverage the strengths of the private and public sectors to expand and improve Arctic infrastructure.

INTRODUCTION

The January 2014 National Strategy for the Arctic Region (NSAR) Implementation Plan (IP) directs the U.S. Department of Transportation to execute three tasks under the objective *Prepare for Increased Activity in the Maritime Domain*. These tasks were delegated to the U.S. Committee on the Marine Transportation System (CMTS) by the Office of the Secretary of Transportation in May 2014.

The CMTS Arctic Marine Transportation Integrated Action Team completed the first deliverable NSAR task *Prepare for Increased Activity in the Maritime Domain* with the delivery of a report, “10-Year Projection of Maritime Activity in the U.S. Arctic”, to the White House National Security Council in December of 2014 (Action 1.1.1).¹ The second task charged the CMTS with developing recommendations for infrastructure needs in the U.S. Arctic. The report, “A Ten-Year Prioritization of Infrastructure Needs in the U.S. Arctic,” provided a framework to coordinate the phased development of Federal MTS infrastructure, and built upon the 2013 CMTS Report to the President, *U.S. Arctic Marine Transportation System: Overview and Priorities for Action*.² This report fulfills Action 1.1.3 to, “Develop recommendations for pursuing Federal public-private partnerships in support of the needs assessment and identified prioritized activities” by the end of 2016.

This report draws upon existing products developed by the CMTS and, independently by Federal agency members of the CMTS, published reports from outside the Federal government, and outreach with Arctic stakeholders and tribal representatives. These sources were used to develop the recommendations for use of public-private partnerships (P3s) to develop, improve and maintain, infrastructure in support of national security, navigation safety, stewardship of natural resources and Federal maritime Arctic activities.

With increased maritime activity in the Arctic over the past decade, there is an emergent need to better understand and characterize the infrastructure requirements and gaps associated with this increased activity, and identify solutions to address those gaps. The Arctic poses unique challenges of difficult environmental conditions, resource constraints, and changing climate which may make traditional solutions unfeasible. This report provides information and resources to inform decision-making, and provide innovative options to address the growing infrastructure needs in the U.S. Arctic.

¹ U.S. Committee on the Marine Transportation System. *A 10-Year Projection of Maritime Activity in the U.S. Arctic Region*. By Alyson J. Azzara, Haifeng Wang, Daniel Rutherford, Brendan J. Hurley, and Scott R. Stephenson. Washington: International Council on Clean Transportation, 2015. 73. Available at http://www.cmts.gov/downloads/CMTS_10-Year_Arctic_Vessel_Projection_Report_1.1.15.pdf.

² U.S. Committee on the Marine Transportation System. *U.S. Arctic Marine Transportation System: Overview and Priorities for Action*. A Report to the President. Available at: <http://www.cmts.gov/downloads/CMTS%20U%20S%20%20Arctic%20MTS%20Report%20%2007-30-13.pdf>.

The report, henceforth referred to as the “Action 1.1.3 Report,” provides background on P3 definitions, and Federal and state statutory and regulatory authorities. It also explores the current applications of P3 to U.S. Arctic maritime infrastructure and provides examples of projects currently underway that use P3 or alternative financing mechanisms. As required, the report also applies potential P3 schema to address the recommendations made in the report under Action 1.1.2, “A Ten-Year Prioritization of Infrastructure Needs in the U.S. Arctic.” Finally, the report includes recommendations and conclusions.

CHAPTER I: THE NATURE OF PUBLIC-PRIVATE PARTNERSHIPS

Definition

Public-Private Partnerships

According to the World Bank, there is no single, widely accepted definition of a public-private partnership (P3).³

The National Council for Public-Private Partnerships defines a P3 as ". . . a contractual arrangement between a public agency (Federal, state or local) and a private sector entity. Through this agreement, the skills and assets of each sector (public and private) are shared in delivering a service or facility for the use of the general public. In addition to the sharing of resources, each party shares in the risks and rewards potential in the delivery of the service and/or facility".⁴

Under a P3, the government retains ownership of the infrastructure asset, while the private sector is afforded a much greater role in delivering and managing the asset over the project's life-cycle compared to conventional procurement.

A number of state and local governments have entered into P3s to provide and manage infrastructure that has traditionally been provided by the public sector, primarily consisting of surface transportation projects as well as water and wastewater projects.

P3s bring private sector capital and management expertise to the challenges of modernizing and more efficiently managing such infrastructure assets.⁵ Under a P3, a government contracts with a private firm to design, finance, construct, operate, and maintain (or any subset of those roles) an infrastructure asset on behalf of the public sector; most P3 projects undertaken in the United States in the last few years have been of the Design-Build-Finance-Operate-Maintain (DBFOM) variety. By the private sector taking on risks that it can more cost-effectively manage, a P3 may save money for taxpayers and deliver higher quality and/or more reliable service in a shorter timeframe compared to traditional procurement.

³ World Bank Group Public-Private-Partnership in Infrastructure Resource Center. *What are Public Private Partnerships?*. Available at: <http://ppp.worldbank.org/public-private-partnership/overview/what-are-public-private-partnerships>.

⁴ National Council for Public-Private Partnerships. *7 Keys to Success*. Available at: <http://www.ncppp.org/ppp-basics/7-keys/>.

⁵ U.S. Department of the Treasury. Office of Economic Policy. *An Economic Framework for Comparing Public-Private Partnerships and Conventional Procurement*. Washington: n.p., 2016. Available at: https://www.treasury.gov/resource-center/economic-policy/Documents/1_PPP%20paper_FINAL%2005%2017%2016.pdf.

When sponsors contract with private partners that support strong labor standards, P3s can also provide local economic opportunities by creating jobs that benefit current and aspiring workers alike. Just as there are a range of roles that a private firm or firms can assume in a P3, the nature of risk-sharing and compensation arrangements for accepting and managing risk can vary substantially from project to project.

Bundling project elements transfers the responsibility, and therefore the risks, to a single private entity for multiple project phases. This approach can lead to incentives to exploit synergies between project phases (e.g. making investment decisions in the construction phase that lower future Operation and Maintenance (O&M) costs). A P3 can also lower monitoring costs for the public sponsor since there are fewer contractual relationships required as compared to conventional procurement instruments. In addition, P3s may provide stronger incentives for on-time delivery in order to start producing cash flows as soon as possible, and realize returns for debt and equity investors.

Many public entities, including some ports, utilize a variety of tenant lease and use agreements by which private partners might construct, finance, and/or operate facilities – the related revenues support various types of debt.

Contracts versus Partnerships

The distinction between contracts and P3s can sometimes be subtle. The table below helps differentiate the approaches.

Service contracts	<ul style="list-style-type: none"> • Service contracts are typically short term contracts (one to three years) where the public agency contracts with a private sector party to provide specified services for the project. • The private sector party receives a service fee in exchange for providing the contractually determined service to the public agency. • The public agency retains ownership and responsibility for all other aspects of the project.
Management contracts	<ul style="list-style-type: none"> • Management contracts are best characterized as a transaction involving two separate developmental stages that are memorialized by a transfer in responsibility. • This contractual structure is typically mid-range in length (two-five years). • The public agency enters into an agreement with a private party to operate, maintain and manage the asset in exchange for a fee.

Public-private partnerships	<ul style="list-style-type: none"> Public-private partnerships are long-term contracts between a private party and a government entity, for providing a public asset or service, in which the private party bears significant risk and management responsibility, and repayment/revenue generation is linked to performance.⁶
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Types of Contracts

Publicly-owned infrastructure assets are typically designed, constructed, operated, and maintained through “conventional procurement,” in which the sponsoring government entity owns the asset but contracts separately for each service, often from different private entities. Under conventional procurement, the government first contracts with a private entity to supply the infrastructure design, then seeks bids to build the asset according to that design, likely from a separate firm, and finally, operates and maintains the infrastructure asset itself, or takes bids from yet another firm to operate and/or maintain the asset on behalf of the government.

A competitive bid approach allows the public sector to have highly qualified private firms fulfill the requirements of various project phases; however, contracted parties do not have an incentive to minimize lifetime project costs, only those costs incurred during their respective phases.⁷ Conventional procurement may also lead to delays if public capital expenditures are dependent on the vagaries of the budget appropriations process. Moreover, funding uncertainties that impede government-provided maintenance may adversely affect long term asset and service quality.

Types of P3s

As with contracts, there are different types of P3 arrangements that have different sets of risks and benefits associated with them. Determining the best P3 arrangement for a specific project is key to designing a successful partnership. This section will discuss five of the more prominent P3 arrangements and will also touch on what is not considered a P3 for the purposes of this report⁸.

⁶ World Bank Group Public-Private-Partnership in Infrastructure Resource Center. *What are Public Private Partnerships?*. Available at: <http://ppp.worldbank.org/public-private-partnership/overview/what-are-public-private-partnerships>.

⁷ U.S. Department of the Treasury, Office of Economic Policy. *An Economic Framework for Comparing Public-Private Partnerships and Conventional Procurement*. Washington: n.p., 2016. Available at: https://www.treasury.gov/resource-center/economic-policy/Documents/1_PPP%20paper_FINAL%2005%2017%2016.pdf.

⁸ U.S. Army Corp of Engineers, *Alaska Deep-Draft Arctic Port System Study*, 2013. Available at: <http://www.poa.usace.army.mil/Portals/34/docs/AKports/1ADDAPSReportweb.pdf>. (Note: these descriptions were taken directly from the USACE annex 5 of the Arctic deep-draft port study.)

- 1) Design Build (DB): A DB allows a private partner to provide both design and construction of a project to the public partner. A simple Design-Build approach creates a single point of responsibility for design and construction and can speed project completion by facilitating the overlap of the design and construction phases of the project. This type of partnership can reduce time, save money, provide stronger guarantees, and allocate additional project risk to the private sector. It also reduces conflict by having a single entity responsible to the public owner for project design and construction. The public sector partner owns the assets and has the responsibility for operation and maintenance. Even this small adjustment to the arrangement has a benefit over conventional procurement. By bundling the responsibility for design and construction, the private firm has an incentive to create the highest quality design in order to minimize design problems and construction issues that could lead to cost overruns.
- 2) Design-Build-Maintain (DBM): A DBM is similar to a DB except the maintenance of the facility becomes the responsibility of the private sector partner for some period of time. The benefits are similar to the DB, with maintenance risk being allocated to the private sector partner and the guarantee expanded to include maintenance. The public sector partner owns and operates the assets.
- 3) Design-Build-Operate (DBO): A single contract is awarded for the design, construction, and operation of a capital asset. Title to the facility remains with the public sector unless the project is a Design/Build/Operate/Transfer or Design/Build/Own/Operate project. The DBO method of contracting is different from the conventional, or traditionally separated and sequential approach ordinarily used in the United States by both the public and private sectors. The traditional method involves one contract for design with an architect or engineer, followed by a different contract with a builder for project construction, followed by the owner's taking over the project and operating it. A simple DB approach creates a single point of responsibility for design and construction. On a public project, the operations phase is normally handled by the public sector under a separate operations and maintenance agreement. Combining all three phases into a DBO approach maintains the continuity of private sector involvement and can facilitate private-sector financing of public projects supported by user fees generated during the operations phase.
- 4) Design-Build-Operate-Maintain (DBOM): The DBOM model is an integrated partnership that combines the design and construction responsibilities of design-build procurements with operations and maintenance. These project components are procured from the private sector in a single contract, with financing secured by the public sector. The public agency maintains ownership
- 5) Design-Build-Finance-Operate-Maintain (DBFOM): With the DBFOM approach, the responsibilities for designing, building, financing, operating, and maintaining are bundled together and transferred to private sector partners. There is a great deal of variety in DBFOM arrangements in the United States, especially the degree to which financial responsibilities are actually transferred to the private sector. One commonality that cuts

across all DBFOM projects is that they are either partly or wholly financed by debt-leveraging revenue streams dedicated to the project. Direct user fees (e.g., tolls) traditionally have been the most common revenue source. However, the availability payment model has been adopted in an increasing percentage of U.S. P3s, and some projects have incorporated revenue-sharing arrangements as a way to mitigate risk. Future revenues are leveraged through public bonds or other debt that provide funds for capital and project development costs. They are also often supplemented by public sector grants or loans in the form of money or contributions in kind, such as rights-of-way.⁹ In certain cases, private partners may be required to make equity investments as well. Value for Money (VfM) for taxpayers can be attained through life-cycle cost optimization, achieved by bundling the responsibility for multiple project phases with a single private partner.¹⁰

As the above are examples of what a P3 can be, it is important also to outline what a P3 is not. While different types of contractual arrangements can be equally valuable in providing needed services, they are not necessarily a P3, and so will be discussed separately.

Each of these P3 arrangements has a specific financing mechanism associated with it. For the DBOFM arrangement, there are a few specific arrangements that can be negotiated to provide financing and return on investment. Financing arrangements are an integral part of partnership negotiations and can determine the distribution of risk between the private and public sector; an important consideration for any project.

The following are examples of arrangements not considered P3s:

1. **Privatization**- transferring an enterprise or industry from the public sector to the private sector.
2. **Joint ventures with the private sector** - a commercial enterprise undertaken jointly by two or more parties that otherwise retain their distinct identities.
3. **Co-ownership with another public sector body** - sharing ownership in an asset with another individual or group.
4. **Arrangements for the divestiture of Federal assets**- where the private partner will become the new owner.
5. **Service only arrangements** – where a business is going to provide services to the public sector.

⁹ U.S. Department of Transportation. Transportation Infrastructure Finance Act and Innovation Act (TIFIA) Joint Program Office. *TIFIA Overview*. Washington: n.p., 2016. Available at: <https://www.transportation.gov/tifia/overview>.

¹⁰ U.S. Department of Transportation. Federal Highway Administration. *Value for Money Assessment for Public-Private Partnerships: A Primer*. Washington, 2012. 1-2. Available at: http://www.fhwa.dot.gov/ipd/pdfs/p3/p3_value_for_money_primer_122612.pdf. (“The VfM analysis process is utilized on a case-by-case basis to compare the aggregate benefits and the aggregate costs of a P3 procurement against those of the conventional public alternative.”)

Although these options are not currently considered P3s in the general sense, the possibility exists for the introduction of an innovative hybrid approach where joint ventures with the private sector and service arrangements can be considered in some type of P3 that is used in the development of an Arctic infrastructure.

For example, the conceptual development of a new category of private partners in Arctic developments could be recognized and created, rather than the current "all or nothing approach" based upon financing when defining P3s. This new category could include a recognition of the value private partners bring to Arctic projects through joint ventures with the private sector, co-ownership with public entities and service arrangements.

Revenue models for P3s

As noted previously, P3s often have a revenue component which set them apart from simple contracting agreements. By using revenue based arrangements, alternative mechanisms for financing the investment are created. Arguably, uncertainty in demand is the most important source of uncertainty affecting an infrastructure project's financial viability, particularly in the case of new build, or "greenfield" projects in which the private partner's compensation is determined by user volume, but for which no history of use exists. P3s have typically used the basic user fee or availability payments models to allocate all demand risk and revenue risk to either the private partner or the government, limiting the number of mutually acceptable P3 deals for investors and project sponsors.¹¹

User fees are collected directly from consumers of an infrastructure service, such as toll roads, bridge tolls, and water service bills. The amount of revenue received by the private partner varies directly with the level of utilization of the infrastructure asset – fewer than expected cars on a toll road means less revenue. As a result, in a "basic" user fee model, the private partner bears all of the demand risk if the project under performs, and also stands to gain and possibly make excess profits if utilization of the infrastructure rises far above expectations.¹²

Availability payments are periodic payments made by the government to the private partner as long as the service meets contracted quality standards. Unlike user fees, availability payments

¹¹ U.S. Department of the Treasury. Office of Economic Policy. *Expanding the Market for Infrastructure Public-Private Partnerships*. Washington, 2015. Available at: <https://www.treasury.gov/connect/blog/Documents/Treasury%20Infrastructure%20White%20Paper%20042215.pdf>.

¹² U.S. Department of the Treasury. Office of Economic Policy. *Expanding our Nation's Infrastructure through Innovative Financing*. Washington, 2014. Available at: https://www.treasury.gov/resource-center/economic-policy/Documents/3_Expanding%20our%20Nation's%20Infrastructure%20through%20Innovative%20Financing.pdf.

are fixed recurring payments that do not vary with usage of the infrastructure asset and may be employed when user fees are not appropriate (e.g. P3 contracts for maintenance of social infrastructure, such as schools or hospitals). Ultimately, the public sponsor must finance availability payments with taxes, user fees that it collects directly from users of the infrastructure asset, or a combination; if these financing sources are insufficient the public sponsor is still obligated to make fixed availability payments to the P3 as long as performance standards are met. Even projects for which user fees are feasible, availability payments are popular with some private sector partners because they eliminate the private firm's exposure to demand-driven revenue volatility. Under an availability payments model, the government bears all of the demand risk if the project under performs, and does not realize any benefit if demand exceeds expectations.¹³

New and alternative P3 incentive structures can potentially align public and private sector interests in infrastructure provision and management, in contrast to the basic user fee and availability payments models that allocate all demand risk (and therefore, revenue risk) to either the private sector partner or the government. For example, incentive structures used in private industries that are regulated to protect the public interest — electric power, gas and oil pipelines, and telecommunications — can be applied to P3s. These industries have attracted substantial private investment flows while providing for demand risk to be shared between the government and the private sector.¹⁴

Determining factors for P3 success

P3s have the potential to deliver higher quality and lower cost projects than traditional procurement, but not all projects are suitable candidates. It is important to evaluate fundamental characteristics of each project to determine whether a P3 is the best approach. An essential requirement for a P3 is that the potential exists for bundling the responsibility for multiple project phases with a single private entity. As discussed previously, bundling can lead to incentives to exploit synergies between project phases, and can therefore achieve lower life-cycle costs than under conventional procurement. Assuming a project meets this basic requirement, other important considerations include:¹⁵

1. Investment size

¹³ *Id.*

¹⁴ U.S. Department of the Treasury. Office of Economic Policy. *Expanding the Market for Infrastructure Public-Private Partnerships*. Washington, 2015. Available at:

<https://www.treasury.gov/connect/blog/Documents/Treasury%20Infrastructure%20White%20Paper%20042215.pdf>

¹⁵ U.S. Department of the Treasury. Office of Economic Policy. *An Economic Framework for Comparing Public-Private Partnerships and Conventional Procurement*. Washington, 2016. Available at:

https://www.treasury.gov/resource-center/economic-policy/Documents/1_PPP%20paper_FINAL%2005%2017%2016.pdf

2. Understanding future costs
3. Leveraging specialized skills
4. Potential for innovation
5. Setting standards
6. Revenue generation

Generally, larger investments lend themselves to the potential for successful partnerships. Projects need to be sufficiently large to offset a P3's higher financing and transactions costs with substantial life-cycle cost savings. An additional benefit of larger projects is that they attract large institutional investors, such as pension funds, that perform important due diligence functions.¹⁶ This can help increase the odds that the project is P3-suitable. Longer contract duration can also help tilt the balance in favor of a P3 by allowing the private partner to rely on a long-term, reasonably secure revenue source to recover its investment and earn a competitive return.

As total investment size is a critical consideration for P3 viability, the ability to forecast costs is equally important when considering the financial viability of a project. Both the private partner and public authority seek predictability when making long-term commitments and there is an increase in risk if costs are not well understood. A component of this is to understand the anticipated useful life of the asset – as indicated above, longer lived assets are generally better suited for P3. Additionally, a fundamental understanding of the expectations for operations and management (if part of the P3) is critical for forecasting the needs over the lifetime of the asset.

If costs cannot be accurately forecasted, P3 contracts should contain profit sharing provisions to mitigate construction cost and operations and maintenance cost risk, and to reduce the risk of project underperformance or contract renegotiation. In other words, if future costs are uncertain, the likelihood of an unanticipated cost “spike” putting the project into financial distress can be lessened by shifting a mutually acceptable portion of the cost risk to the public sponsor. For example, if an unexpected “spike” should occur, then both the private partner and project sponsor will absorb part of the negative impact. Of course, in exchange for being willing to shoulder some of the project's downside risk, the contract should stipulate that the government will also share in any unexpected gains, if, for example a technical innovation leads to lower costs and higher profitability. These types of profit sharing provisions also reduce the likelihood that the private partner will want to renegotiate the contract when it is impacted by an unforeseen jump in costs, which could result in the sponsor having to absorb the entire impact.

One benefit of seeking private partners is the ability to leverage their specialized skills and expertise. If the private sector can demonstrate an advantage over the public sector in complex

¹⁶ *Id.* (Due diligence refers to an investigation that an investor makes of a company or project before a contract is signed, and can include items such as reviewing documentation, evaluating a project's financial viability and assessing the legal and regulatory environment in which the project will be undertaken.)

projects that combine a mix of required skill sets over the project's life-cycle, then a P3 may deliver an infrastructure asset with higher quality or lower costs. Depending on the specifics of the project, private-sector expertise may be more likely, especially if projects of a similar size and scope have been previously executed. Additionally, if there are multiple potential private partners with expertise, then competition in bidding and greater costs savings for the public sector may result.

One of the advantages to using private industry as a partner is that there may be a scope for private-sector innovation that is not present with conventional procurement. The incentive to innovate depends heavily on the use of performance-based contracts incorporating enforceable quality and output targets. Granting the private sector control over which technical solution they use maximizes the incentive to meet the stipulated targets at the lowest cost. However, if the public sector feels it must prescribe input specifications rather than let the private sector make those decisions, because, for example, the project has stringent security requirements, then conventional procurement is likely preferable.

As with most partnerships, the duties and expectations for each member need to be clearly defined. It is important for the public authority to clearly state and enforce asset and/or service quality standards in the contract to prevent cost reductions that come at the expense of lower asset or service quality. Linked with this are performance specifications and indicators, for example, the time ships need to wait before obtaining a berth at a port, the speed with which cargo is unloaded, or how long it takes a private emergency response team to get underway after a distress call is made. These metrics are an integral element in determining whether the agreed to standards are being met. If enforceable quality standards cannot be written into the contract, conventional procurement may be preferable.

Possibly the most important aspect of determining whether a project is suitable for P3, is whether the investment has an inherent scope to generate revenue. Although revenue generation is not a requirement for a successful P3, the generation of a return on investment could reduce the burden on public funds. At its heart, a P3 furnishes alternative financing mechanisms, not funding. The provision of a revenue stream for private partners is a critical aspect of the partnership.

Best practices

While successful P3s can produce a higher net benefit to the public than using traditional procurement methods, the process and structure are more complex, requiring additional actions and expertise from the public sector to successfully provide the necessary infrastructure.

There are several areas where proactive planning can help maximize the net social benefits of P3 procurement and the project's success. Considerations include fostering environments conducive

to P3s, pursuing rigorous project preparation, critically assessing the feasibility of the project, and structuring the risk so it is balanced across P3 contract parties.

Fostering an environment favorable for P3s may include a number of elements. Enacting enabling legislation creates a predictable legal and regulatory framework for partners and investors. Removing or mitigating the risk creates an environment that fosters open discussion while removing the uncertainty about legal authorities or jurisdictions. Successful negotiation of a P3 also requires internal public sector capacity and expertise. These elements are facilitated by developing standardized tools and products that support technical assistance and P3 policy formulation. Finally, developing guidelines for effective stakeholder engagement is critical to effectively addressing potential stakeholder concerns.

Managing a rigorous project preparation process is also a key to success. In preparation for potential partnerships, setting up core frameworks such as project management offices, an interdisciplinary expert team and determining a standardized process for preparation of P3 proposals are all key elements. These efforts will help to create a transparent governance structure as well as facilitate the process and funding for completing feasibility studies, a necessary step in determining if P3 is the right direction for the project. By engaging in critical planning, monitoring functions, and the development of output metrics to track performance, the underlying requirements for performance-based contracts are created, a necessary element for cost-effective and high-quality P3s.

As mentioned above, understanding the financial viability and lifecycle of a project is key to determining its success as a P3. Conducting a feasibility study is one of the tools that can be used to determine financial viability, the outcome of which can lead to a more robust project. Feasibility studies can help mitigate “optimism bias” in forecasts such as overly optimistic demand forecasts for projects that are heavily dependent on user fees. Elements of the study can include performing technical, commercial, legal, and environmental studies that demonstrate project viability as well as evaluating output specifications in contracts and examining other potential revenue sources.

One of the primary reasons to engage in a P3 over conventional procurement is to shift some of the project risk away from the public sector (taxpayers). This shift needs to be conducted equitably and in such a way that the private sector still sees an expected return to the project commensurate with the assumed risk. This process may include contractual allocation of controllable risks to the party best able to manage them, implementing flexible risk-sharing arrangements, and incorporating a system of quality and output-based penalties and rewards into the contract. Such contract structures can increase the attractiveness of projects to both parties by allowing both to share in the potential upsides and downsides of the investment. Most importantly, P3s support the level of investment that most benefits society.

Constrained budgets at all levels of government have created the need for innovative financing methods to meet the nation's infrastructure needs. P3s are a promising approach that leverages the strengths of the private and public sectors. However, P3s are not a good fit for all projects; the public authority must screen projects for their suitability factors and perform a set of preparatory actions, or best practices, before the project gets underway.

These general P3 principles can be adapted for regional needs, such as those of the Arctic. To do this, some independent organizations have created their own frameworks or guidelines for engaging in Arctic investment. For example, the World Economic Forum has created an Arctic Investment Protocol including guidelines for responsible investment in the Arctic. They promote six principles as a means to balance both the diversity and environmental sensitivities of the region with an emerging global investment opportunity:

1. Build resilient societies through economic development;
2. Respect and include local communities and indigenous people;
3. Pursue measures to protect the environment of the Arctic;
4. Practice responsible and transparent business practices;
5. Consult and integrate science and traditional ecological knowledge; and
6. Strengthen pan-Arctic collaboration and sharing of best practices.

Cooperation among investors, local communities, indigenous peoples, public sector and private interests are required to achieve these goals. This approach advocates for fair, legal, and transparent actions, and the promotion of cross-border dialogue and cooperation to strengthen pan-Arctic collaboration and share best practices.

The Arctic Economic Council (AEC) is another organization with a mission to facilitate Arctic business-to-business activities and responsible economic development. They are focused on five themes designed to enable sharing of best practices, technological solutions, standards, and other information:

1. Establishing strong market connections between the Arctic states;
2. Encouraging public-private partnerships for infrastructure investments;
3. Promoting stable and predictable regulatory frameworks;
4. Facilitating knowledge and data exchange between industry and academia; and
5. Integrating traditional indigenous knowledge, stewardship and a focus on small businesses.

Among other goals, the AEC highlights an understanding of the need for infrastructure investments and the costs associated with enabling infrastructure that would make business undertakings more economical and feasible. The organization acknowledges that P3s enable stakeholders from government, industry, and other organizations to come together to identify the most viable and broad based economic solutions. The AEC works to ensure that P3 is

considered where applicable, to promote best regulatory practices, and, to the extent possible, seeks to align rules and regulations to ease the flow of business.

The general practices of these two organizations align closely with the broad best practices described above and provide examples of how they can be incorporated into the application of P3s by specific groups.

CHAPTER II: AUTHORITIES FOR PUBLIC-PRIVATE PARTNERSHIPS

U.S. Federal Authority

The statutory authority for Federal departments and agencies to enter into P3s is very diverse across the U.S. Government. Following are a few examples.

The 2014 Water Resources Reform and Development Act (WRRDA) was enacted as a nexus for the establishment of P3s in the transportation sector.¹⁷ The primary goal of WRRDA is the encouragement of private sector participation in water resources projects that are beneficial to the general public.¹⁸ One of the provisions of WRRDA required the establishment of the Water Infrastructure Public Private Partnership Program (WIPPP). WIPPP facilitates the “establishment of innovative financing mechanism to carry out and manage the design and construction of [Army] Corps projects by involving the private sector.”¹⁹ Furthermore, the WRRDA created a Water Infrastructure Finance Innovations Authority (WIFIA) “to provide credit assistance for drinking water, waste water, and water resources infrastructure projects.” This project employs the model of the Transportation Infrastructure Finance and Innovation Act (TIFIA) program for surface transportation.²⁰ WIFIA is a five-year program that “leverages Federal funds by attracting substantial private or other non-Federal investments to promote infrastructure development.”²¹

The Transportation Infrastructure Finance and Innovation Act (TIFIA) provides long-term, flexible financing to highway and transit projects that feature dedicated revenue sources. Each dollar of Federal TIFIA funding can support about \$10 in loans, loan guarantees, or lines of credit.²² TIFIA plays a significant role in financing large scale surface transportation projects, including highways, public transit, passenger and freight railroads, intermodal freight, and port access. The Fixing America’s Surface Transportation Act (FAST) expands eligibility to include transit-oriented development and the capitalization of a rural projects fund within a state

¹⁷ Water Resources Reform and Development Act of 2014, Pub. L. No. 113-121. Available at: <https://www.gpo.gov/fdsys/pkg/PLAW-113publ121/html/PLAW-113publ121.htm>.

¹⁸ United States House of Representatives: Committee on Transportation and Infrastructure. *Roundtable Policy Discussion on “Public Private Partnerships for America’s Waterways and Ports”*. Washington, 2014. 6-7. Available at: http://transportation.house.gov/uploadedfiles/2014-07-10-p3_panel_ssm.pdf.

¹⁹ *Id.* at 7.

²⁰ *Id.*

²¹ *Id.*

²² U.S. Department of Transportation, Transportation Infrastructure Finance Act and Innovation Act (TIFIA) Joint Program Office, Chapter 2: Terms and Funding of Credit Instruments. Washington, 2016. Available at: <https://www.transportation.gov/tifia/chapter-2-terms-and-funding-credit-instruments>. (Traditionally, TIFIA loans have covered up to 33 percent of eligible project costs. MAP-21 legislation increased the percent to 49, however, applicants requesting assistance above 33 percent must provide a strong rationale. Loan guarantees, in combination with any other TIFIA credit assistance may not exceed 49 percent of reasonably anticipated eligible project costs. The total principal amount of a stand-by line of credit can cover up to 33 percent of project costs.)

infrastructure bank.^{23, 24} The program focuses on attracting substantial private and other non-Federal co-investment by providing supplemental and subordinate capital, and plays a significant role in transport P3 investment. In many cases, the lower cost of capital and flexible terms offered by TIFIA are critical factors in determining whether a P3 is a viable and cost-effective option for a project.

In the context of P3s, research and development projects can be conducted in the form of Cooperative Research and Development Agreements (CRADA).²⁵ CRADAs are a result of the Stevenson-Wylder Technology Innovation Act of 1980 and were amended by the Federal Technology Transfer Act of 1986.²⁶ This government-wide authority “allows the Federal Government, through its laboratories, to provide personnel, services, facilities, equipment, intellectual property or other resources with or without reimbursement to non-Federal parties and the non-Federal parties to provide similar resources toward the conduct of specific research or development efforts consistent with the mission of the labs.”²⁷ The individual department “publishes approved documents and potential available markets” that are utilized by the private sector to facilitate the development of solutions for the department.²⁸ These initial partnerships are formalized through CRADAs that “describe in the detail the relationship, roles and responsibilities and deliverables for each party.”²⁹ The implementation of CRADAs results in a competitive bidding process and cooperative relationships between the public entity and the private sector.

²³ U.S. Department of Transportation. DOT Press Office. U.S. Transportation Secretary Foxx Announces Notices of Funding Availability for Infrastructure Projects. Washington, 2016. Available at: http://www.marad.dot.gov/newsroom/news_release/2016/u-s-transportation-secretary-foxx-announces-notice-of-funding-availability-for-infrastructure-projects/.

²⁴ United States House of Representatives: Committee on Transportation and Infrastructure. *Joint Explanatory Statement of the Committee of the Conference*. Washington, 2015. Available at: http://transportation.house.gov/uploadedfiles/joint_explanatory_statement.pdf

²⁵ 15 U.S.C. § 3710(a)

²⁶ Department of the Interior. Office of the Solicitor. *Partnership Legal Primer*. Washington, 2004. 1, 26. Available at: <http://www.doi.gov/partnerships/upload/partnershiplegalprimer1stedition.pdf>.

²⁷ Technology Transfer Mission (48 CFR § 970.5204-40). Available at: https://books.google.com/books?id=nq88AAAIAAJ&pg=PA489&lpg=PA489&dq=allows+the+Federal+Government,+through+its+laboratories,+to+provide+personnel,+services,+facilities,+equipment,+intellectual+property+or+other+resources+with&source=bl&ots=4--1_jcYEK&sig=KOUgi7t-4brsun5GTjaojZZANW0&hl=en&sa=X&ved=0ahUKEwi1hKayNXPahUBVh4KHbsRAKgQ6AEIPDAF#v=onepage&q=allows%20the%20Federal%20Government%2C%20through%20its%20laboratories%2C%20to%20provide%20personnel%2C%20services%2C%20facilities%2C%20equipment%2C%20intellectual%20property%20or%20other%20resources%20with&f=false.

²⁸ U.S. Department of Homeland Security. *Innovative Public-Private Partnerships: Pathway to Effectively Solving Problems*. Washington, 2010. Thomas A. Cellucci. 1, 21. Available at: http://www.dhs.gov/xlibrary/assets/st_innovative_public_private_partnerships_0710_version_2.pdf.

²⁹ *Id.*

In recent years, the White House has initiated two efforts that directly and indirectly impact the application of P3s in government infrastructure-related activities. In 2013, the Office of Management and Budget (OMB) published a Super Circular (78590) to “deliver on the promise of a 21st-Century government that is more efficient, effective, and transparent.” The Super Circular focuses on reforming Federal administrative requirements, cost principles, and audit requirements for Federal awards.³⁰ These reforms aim to strengthen internal compliance requirements and accountability while also providing administrative flexibility for non-Federal entities. OMB developed the Super Circular in response to “directives from President Obama regarding reducing unnecessary regulatory and administrative burdens, redirecting resources to services that are essential to achieving better outcomes at lower cost, and strengthening accountability by intensifying efforts to eliminate payment error, waste, fraud and abuse.”³¹ In essence, the reforms within the Super Circular help enhance the use of P3s.

On July 17, 2014, the President released a memorandum launching the Build America Investment Initiative, directing Federal agencies to expand public-private collaboration on infrastructure development and financing.³² A significant result of the directive is the Department of Transportation’s Build America Transportation Investment Center (BATIC), now the Build America Bureau (the “Bureau”).³³ The Bureau helps to connect government agencies and private industries and assist companies across the country to navigate the process involved in designing, financing, building, and permitting large-scale surface transportation improvement projects.³⁴ The goal is for the Bureau to be a one-stop shop for state and local governments, public and private developers, and investors seeking to utilize innovative financing strategies for surface transportation infrastructure projects.³⁵ Separately, under the Maritime Administration’s Strong Ports program, the Department of Transportation, in collaboration with the American Association of Port Authorities, developed a Port Planning and Investment “Toolkit” to assist port authorities pursuing modernization projects, including those interested in P3.

³⁰ Office of Management and Budget, *Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards*, 78 Fed. Reg. 78590. Washington, 2013. Available at: <https://www.gpo.gov/fdsys/pkg/FR-2013-12-26/pdf/2013-30465.pdf>.

³¹ Eleanor A. Evans. *Navigating the OMB Super Circular Changes*. CAPLAWupdate (2014). Available at: http://www.caplaw.org/resources/PublicationDocuments/updatesnewsletter/2014/CAPLAW_NavigatingtheOMBSuperCircularChanges_SpecialEdition2014.pdf.

³² Office of the Press Secretary. *Presidential Memorandum – Expanding Public-Private Collaboration on Infrastructure Development and Financing*. Washington, 2014. Available at: <http://www.whitehouse.gov/the-press-office/2014/07/17/presidential-memorandum-expanding-public-private-collaboration-infrastru>.

³³ Brigham A. McCown, *Will Public Private Partnerships Build the Future?* Forbes, 8/27/2014. Available at: <http://www.forbes.com/sites/brighamccown/2014/08/27/building-partnerships-for-the-future/>.

³⁴ *Id.*

³⁵ The Fixing America’s Surface Transportation Act (FAST Act) signed by the President last December effectively institutionalizes BATIC’s key functions at DOT.

The combination of these two examples directly aligns with the best practices for successful P3s by creating recommendations supporting the use of innovative financing and developing a center responsible for supporting P3 information sharing and best practices development.

Table 1 Federal Agency Statutory Authorities: A summary of some of the statutory authorities given to Federal agencies.

DEPARTMENT/AGENCY	AUTHORITY	SUMMARY
DEPARTMENT OF TRANSPORTATION/ MARITIME ADMINISTRATION	46 U.S.C. § 50307 authorizes the Secretary of Transportation to	[E]ngage in the environmental study, research, development, assessment, and deployment of emerging marine technologies and practices related to the marine transportation system through the use of public vessels under the control of the Maritime Administration or private vessels under the United States registry, and through partnerships and cooperative efforts with academic, public, private, and nongovernmental entities and facilities.
	46 U.S. Code § 50302 - Port development	Port Infrastructure Development Program.— The Secretary of Transportation, through the Maritime Administrator, shall establish a port infrastructure development program for the improvement of port facilities as provided in this subsection. In order to carry out any project under the program established under paragraph (1), the Administrator may receive funds provided for the project from Federal, non-Federal, and private entities that have a specific agreement or contract with the Administrator to further the purposes of this subsection
	Authorizing statute 42 U.S.C. § 7256 and 42 U.S.C. § 16154	Authorizes the Secretary of Energy to “conduct a research and development program on technologies relating to . . . hydrogen energy, fuel cells, and related infrastructure.” These partnerships are with other Federal agencies and the private sector.”
DEPARTMENT OF ENERGY	43 U.S.C. is the implementing statute for the Department of the Interior. 43 U.S.C. § 1737	Secretary of the Department of the Interior the discretion to enter into contracts and cooperative agreements involving the management, protection, development, and sale of public lands.

DEPARTMENT OF INTERIOR	6 U.S.C. § 111 establishes the Department of Homeland Security 6 U.S.C. § 112(f) enables the Secretary of the Department of Homeland Security to appoint a Special Assistant.	Through the use of public-private partnerships, the Special Assistant to the Secretary must utilize the private sector to aid research and development, help secure the best available information, and protect critical infrastructure from terrorist attacks.
DEPARTMENT OF HOMELAND SECURITY	6 U.S.C. § 111 establishes the Department of Homeland Security 6 U.S.C. § 112(f) enables the Secretary of the Department of Homeland Security to appoint a Special Assistant.	Through the use of public-private partnerships, the Special Assistant to the Secretary must utilize the private sector to aid research and development, help secure the best available information, and protect critical infrastructure from terrorist attacks.

State of Alaska Authorities

In addition to Federal authorities providing authorization for P3s, the State of Alaska has specific authorities facilitating the use of P3 for infrastructure investment as well as authorizing a host of loan, grant and financing programs through state designated organizations.

Table 2 Alaska Authorities: A summary of some of the Alaska statutory authorities.

State of Alaska Authority	<p>17 Alaska Administrative Code (AAC) 95.040 is the implementing statute</p> <p>17 AAC 95.020, 17 AAC 95.030 are the provisions in which a public-private partnership can be awarded</p>	<p>The authority can enter in P3s for a variety of services, which include services for engineering, design, maintenance, etc.</p> <p>Proposers selected from a shortlist of proposers are eligible for an award for a P3 agreement</p>
Alaska Industrial Development and Export Authority (AIDEA)	<p>Alaska Statute (AS) 44.88.010-120 is the implementing statute for the AIDEA</p> <p>AS 44.88.010 (10(A)) encourages private investment</p>	<p>The Legislature created AIDEA to provide financing for Alaskan businesses to expand the economy of the state and provide jobs for Alaska.</p> <p>AIDEA also works with private partners to invest, lend, and import capital. The private partners include people, banks and other financial institutions.</p>
Alaska Energy Authority (AEA)	<p>AS 44.83 is the enabling legislation for the Alaska Energy Authority</p>	<p>AEA emphasizes community-based project management. AEA's core programs work to diversify energy Alaska's energy portfolio, lead energy planning and policy, invest in Alaska's energy infrastructure and provide rural Alaska with technical and community assistance. The AEA provides grant, loan and other financing programs to reduce the cost of energy in Alaska.</p>
Power Cost Equalization (PCE) Program	<p>AS 42.45.100-170</p>	<p>The Regulatory Commission of Alaska (RCA) determines if a utility is eligible to participate in the program and calculates the amount of PCE per kWh payable to the utility.</p> <p>The AEA determines eligibility of community facilities and residential customers and authorizes reimbursement to the electric utility for the PCE credits extended to customers.</p>

The Alaska Industrial Development and Export Authority (AIDEA) is a public corporation of the State of Alaska, created in 1967 by the Alaska Legislature.³⁶

They serve the Governor and the State of Alaska as the state's development financing authority. AIDEA's mission is to provide various means of financing to promote economic growth and diversity by acting as a funding resource in partnership with other financial institutions, economic development groups and guarantee agencies.

Specifically, Alaska Statute § 44.88 (2014) creates strong financial incentives for private sector construction of ports, roads, and other critical projects in Alaska's Arctic region. In conjunction with AIDEA, the funds establish a program where borrowers must be found to meet "sufficient job creation, rural development, Arctic infrastructure development, or other economic development criteria." By providing access to the state's revolving fund through payment of a reasonable dividend rate, the Statute offers stable government funding with limited requirements and restrictions on the amount and duration of the loan. Overall, the goal of the Statute is to promote the "construction, improvement, rehabilitation, or expansion of a facility" either in the Arctic to aid in regional development or meet emergency response needs, in the state if such furthers development in the Arctic, or in relation to shore-based facilities that service fisheries in the Arctic.

The Alaska Energy Authority (AEA) is an independent corporation governed by a board of directors with the mission to "reduce the cost of energy in Alaska." AEA is the state's energy office and lead agency for statewide energy policy and program development (more information on the AEA is provided in the below).³⁷

AEA also manages the Renewable Energy Fund³⁸, the Emerging Energy Technology Fund³⁹, the Power Cost Equalization Program, Power Project Loan Fund⁴⁰, and various Energy Efficiency and Conservation Programs.⁴¹ AEA provides grants and loans for qualified energy infrastructure projects and also owns energy infrastructure for the benefit of Alaskans.

³⁶ State of Alaska. Alaska Industrial Development and Export Authority. Available at: <http://www.aidea.org/AIDEAHome.aspx>.

³⁷ State of Alaska. Alaska Energy Authority. Available at: <http://www.akenergyauthority.org/>.

³⁸ State of Alaska. Alaska Energy Authority. Renewable Energy Fund: Status Report and Round VIII Recommendations. Anchorage, AK, 2015. Available at: <http://www.akenergyauthority.org/Content/Programs/RenewableEnergyFund/Documents/REFAEAprinterspreads8515II.pdf>.

³⁹ State of Alaska. Alaska Energy Authority. Emerging Energy Technology Fund. Available at: <http://www.akenergyauthority.org/Programs/EETF>.

⁴⁰ State of Alaska. Alaska Energy Authority. Loan Programs: Power Project Loan Fund. Available at: <http://www.akenergyauthority.org/Programs/Loans>

⁴¹ State of Alaska. Alaska Energy Authority. Power Cost Equalization. Available at: <http://www.akenergyauthority.org/Programs/PCE>.

CHAPTER III: APPLICATION OF P3 TO U.S. ARCTIC INFRASTRUCTURE

The development of P3s in the U.S. Arctic could provide the necessary investment flexibility to enable construction of vital MTS-related infrastructure in the region. MTS-related infrastructure includes the traditional definition of physical infrastructure, but also includes communication, planning, management, and response infrastructure. This report assumes the presence of a business case to make P3s viable.

In addition to providing enabling legislation for P3s, WRRDA (Sec. 2105) on Arctic deep-draft port development partnerships states that the Secretary of the Army may provide technical assistance to non-Federal public entities, including Indian tribes... for the development, construction, operation, and maintenance of channels, harbors, and related infrastructure associated with deep-draft ports for purposes of dealing with Arctic development and security needs; further... The Secretary of the Army is authorized to accept and expend funds provided by non-Federal public entities, including Indian tribes... to carry out the technical assistance activities described in subsection (a).⁴²

This WRRDA language, in addition to encouraging private sector participation in water resources projects that are beneficial to the general public, also specifically outlines language for the way in which the Federal Government can partner with other non-Federal, public entities, like tribes and states to achieve an Arctic deep-draft port.

P3 requires additional partnerships, not from public entities, but from private partners. As previously noted, a true P3 is not a source of funding, but rather a source of financing. As with other large infrastructure projects there are limitations to the role each partner can play. Ports can be particularly complex because of the number of players engaged in port activities and commerce who need to be active in the process. The success of a port is not directly comparable to the success of a road or bridge because ownership and operation of port facilities, such as private terminals, do not fall to the Federal Government or state, and, particularly is the case for operations, often are separate from the authority of the Port Authority.

The U.S. Army Corps of Engineers, for example, may have the authority to dredge a public channel leading into the port, and may provide funding for building a publically owned pier, but would not have the authority to, construct a private terminal or dredge a private channel or turning basin. The construction and maintenance of privately owned terminals, docks, and piers falls to another party in the arrangement.

⁴² Water Resources Development (33 U.S.C. § 2243), Subtitle II -- Port and Harbor Maintenance, Arctic deep draft port development partnerships. Available at: <https://www.law.cornell.edu/uscode/text/33/2243>.

There are several P3s that can serve as examples for potential future arrangements in the U.S. Arctic. These range from agreements with Federal partners, to state, and regional partners and cover a variety of infrastructure types.

Delong Mountain Transportation System (DMTS)

The Alaska Industrial Development and Export Authority (AIDEA) is a public corporation of the State of Alaska, created in 1967 by the Alaska Legislature.⁴³ One of AIDEA's original projects is the Delong Mountain Transportation System (DMTS). The DMTS is a 52-mile long, 30-foot wide industrial haul road and a shallow-draft port with upland support facilities. The system opened in 1989 to support the development of the Red Dog Mine in northwest Alaska. The Red Dog Mine is operated by Teck Alaska, Inc. in conjunction with a local native corporation (NANA Regional Corporation, Inc.) and is one of the largest producing zinc mines globally. The DMTS provides the necessary infrastructure for the transport of the ore from the mine site to the ore export barges.

Construction of the DMTS facilities was funded through an initial \$180 million in AIDEA cash and bonding; the 1999 expansion involved approximately \$87 million of additional bonding. Repayment of these bonds is achieved through a "toll" structure for use of the system by mine company customers. The toll mechanism provides for a minimum annual payment and additional payments based on escalated zinc prices and higher throughputs. The additional throughput payments are deposited to a reserve account that is used for any potential unpaid operation costs or future capital improvements. Excess reserve account balances are then periodically distributed to AIDEA, Teck, and for expedited retirement of AIDEA's investment in the project.⁴⁴

Ketchikan Shipyard

The Ketchikan Shipyard is located in Ketchikan, Alaska, adjacent to the Alaska Marine Highway System (AMHS) ferry facility. The shipyard consists of approximately 25.27 acres of real property including various building, fixtures, a 10,000 long ton floating dry dock, various equipment and tools, and other personal property. In 1997, the shipyard was transferred to

⁴³ State of Alaska. Alaska Industrial Development and Export Authority. Available at: <http://www.aidea.org/AIDEAHome.aspx>.

⁴⁴ State of Alaska. Alaska Industrial Development and Export Authority. 30 Years of AIDEA support for Alaska's Mining Industry. Available at: <http://www.aidea.org/Programs/ProjectDevelopment/30YearsofMiningSupport.aspx>; State of Alaska. Alaska Industrial Development and Export Authority. *Delong Mountain Transportation System*. 2016. Available at: http://www.aidea.org/Portals/0/PDF%20Files/PFS_DMTS.pdf.

AIDEA. In conjunction with the transfer, an MOU between AIDEA, the City of Ketchikan, Ketchikan Public Utilities and the Ketchikan Gateway Borough was created.

AIDEA has made capital investments in the shipyard, including the cost of acquiring the shipyard (\$80.3 million) and a partial match to a 1999 Federal TEA-21 grant. AIDEA has also matched Borough contributions to the repair and replacement (R&R) fund. AIDEA's financial returns are through revenue and net profit sharing via payments to AIDEA, first to reimburse AIDEA's administrative expenses (up to \$18,000), next into the R&R fund until its funded to 125 percent, and then distributed as profit sharing to the AIDEA, Borough and City of Ketchikan.⁴⁵ The Ketchikan Shipyard is leased out to a private operator who has a revenue sharing agreement with AIDEA for use of the facility.

Bradley Lake Hydroelectric Project

Alaska Energy Authority (AEA) is an independent corporation of the State of Alaska and the state's energy office. Their programs place Alaska at the forefront of innovative ways to address high energy costs. The Bradley Lake Hydroelectric Project is one of several AEA projects and is located 27-air miles northeast of Homer on the Kenai Peninsula. The Project has 120 megawatts of installed capacity, providing five to ten percent of the annual Railbelt electric power.⁴⁶ The project consists of a 125-foot high concrete-faced, a rock-filled dam structure, three diversion structures, a 3.5-mile long power tunnel and vertical shaft, a generating plant, an interior substation, 20 miles of transmission line, and substation. Due to its remote location, the project has its own airstrip, boat dock, residential quarters, and utility system.

The Alaska Energy Authority assumed responsibility for the project in 1982. In 1987, AEA and the Railbelt utilities entered into a Power Sales Agreement. The Project has been online since Sept. 1, 1991. Total project costs, including major capital improvements, as of June 30, 2015 are \$328 million. The project was funded through legislative appropriations and AEA revenue bonds that are being repaid by the participating utilities. The Bradley Project Management Committee (BPMC) was formed in 1988 with representatives from each of the power purchasers and AEA and generally manages the project.

⁴⁵ State of Alaska. Alaska Industrial Development and Export Authority. Ketchikan Shipyard. 2016. Available at: http://www.aidea.org/Portals/0/PDF%20Files/PFS_KSY.pdf.

⁴⁶ *Id.* (Alaska's Railbelt region stretches from the Kenai Peninsula north more than 500 miles to Fairbanks. This portion of the state, named for areas reached by the Railroad, is home to 70 percent of Alaska's population.)

CHAPTER IV: FUNDING THE DEVELOPMENT OF ENABLING INFRASTRUCTURE

The recommendations in this chapter are those put forward in the NSAR Implementation Plan Task 1.1.2, “10-Year Prioritization of Infrastructure Needs in the U.S. Arctic,” as approved by the Secretary of Transportation in April 2016. These recommendations include the components of U.S. Arctic infrastructure necessary for safe, secure, and environmentally responsible maritime operations. Many of the recommendations assume the existence of basic underlying infrastructure that can be leveraged to achieve those goals. In parts of the contiguous United States, assets such as readily available road, rail, aviation, and port structures are common-place. However, Alaska is a unique and dynamic region where these assets cannot be assumed as available even as the need is equally or more important. For instance, timely search and rescue and emergency response capability may be more critically important in the harsh Arctic environment than anywhere else, but are less likely to have underlying infrastructure necessary for a successful mission. While many of the authorities to respond fall to Federal and state governments, the construction, operation and maintenance of critical enabling infrastructure may be achievable by local and regional bodies through the use of P3s.

While many of the recommendations are for specific elements of infrastructure, they all rely, in some part, on underlying infrastructure that provides the necessary baseline from which to build.

Information Infrastructure

Communications

Recommendation: *Advance Arctic communication networks to ensure vessel safety.*

There are a number of programs that provide investment in communications networks that may be used to support Arctic maritime communication. Some of the underlying needs to support growth in the region include phone, internet, and radio communication networks. Although there is infrastructure in place, coverage is limited and not available at the same standard rates or costs as in the rest of the U.S. This gap in service has been recognized, and efforts are underway to expand coverage and service. These types of programs and the services they provide may be leveraged to enhance maritime safety through providing more reliable communications in the U.S. Arctic.

In 2011, the Federal Communications Commission (FCC) created the Connect America Fund (CAF), designed to connect all Americans to high-speed Internet, wherever they live. CAF provides support to certain qualifying telephone companies that serve high-cost, primarily rural areas, ensuring that the residents of these regions have access to reasonably comparable service at rates reasonably comparable to urban areas. Working through a non-profit corporation that it

created for this purpose, the FCC makes payments to telephone companies operating in high cost areas that enable them to cover the difference between what customers are able to pay for service and their costs. The subsidy payment is analogous to an availability payment because it includes specific service requirements and accountability that need to be maintained in order to receive the funding. Although the assets remain privately held, the private company has a duty to provide a specified level of service in order to receive the public funds through the program.

More recently, in July 2015, the President and the Department of Housing and Urban Development (HUD) announced the ConnectHome demonstration project. This new initiative works with communities, the private sector, and Federal Government to expand high speed broadband to more families across the country. The pilot program is launching in twenty-seven cities and one tribal nation and will initially reach over 275,000 low-income households – and nearly 200,000 children – with the support they need to access the Internet at home. The public-private partnership with Internet Service Providers, non-profits, and the private sector will offer broadband access, technical training, digital literacy programs and devices for low-income residents in assisted housing units.⁴⁷

Lastly, in June 2013, the President and the Department of Education (ED) launched ConnectED, a public-private partnership that “empowers teachers with the best technology and the training to make the most of it, and empowers students through individualized learning and rich, digital content.” ConnectED’s objective is to connect 99 percent of American students to next-generation broadband by 2018.

While broadband is just one element of the communication infrastructure needs in the U.S. Arctic, programs specifically targeted at providing a service, for example very high frequency (VHF) repeaters and tower infrastructure to support maritime ship-to-ship and ship-to-shore communication, could be developed based on identified providers and users of the system.

The August 2015 report of the Broadband Opportunity Council, co-chaired by the Departments of Commerce and Agriculture, includes recommendations to encourage P3s. The report acknowledges that the deployment of broadband requires collaboration between the public and the private sector. It also recommends that as Federal agencies shape their broadband policies, they should work closely with state, local and tribal governments and the private sector to ensure those policies maximize overall investment in and adoption of broadband services.⁴⁸

⁴⁷ Office of the Press Secretary, *FACT SHEET: ConnectHome: Coming Together to Ensure Digital Opportunity for All Americans*. Washington, 2015. Available at: <https://www.whitehouse.gov/the-press-office/2015/07/15/fact-sheet-connecthome-coming-together-ensure-digital-opportunity-all>.

⁴⁸ Pritzker & Vilsack, *Broadband Opportunity Council Report and Recommendations*, Washington, 2015. Available at: https://www.whitehouse.gov/sites/default/files/broadband_opportunity_council_report_final.pdf.

Communication services can enable sharing of faster environmental data, such as weather or ice conditions, or notices to mariners. These services are integral for ensuring safe marine transportation.

Physical Infrastructure

Port Access

Recommendation: *Consider options for Federal deep-draft port facilities with cooperative agreements for dual use with local communities and facilities to meet multiple requirements.*

Ports are critical water/land connectors with specialized infrastructure to support commercial activities, governmental operations, recreation, tourism, and research vessels. Using P3 to finance a pier facility with support equipment (e.g. cranes, minor repair/husbandry, warehousing) and allowing use of tariffs and tax incentives to provide revenue to reimburse the investment is a potential mechanism to facilitate development of port infrastructure. This approach could allow for a much larger development and for potential public funding.

There are a number of examples of how the U.S. Federal Government interacts with ports and port areas that provide starting points and avenues for discussion on the potential for meeting U.S. Arctic port needs.

The General Survey Act of 1824 established the U.S. Army Corps of Engineers' (USACE) role as the Federal water resource agency with the primary mission for constructing and maintaining a safe, reliable, and economically efficient navigation system. Part of this mission is accomplished through dredging. Dredging is performed primarily by the Corps of Engineers at navigation channels and by port authorities at harbors. There are five major areas where USACE is responsible for dredging:

1. Main approaches (approach channel in ocean)
2. Bar channels (sandbars at inlets)
3. Entrance channels (to harbors)
4. Berthing areas (harbors/ports)
5. Inland waterways (intracoastal waterways and river channels)

Outside of these areas, the responsibility for maintaining the port channel, pier, or terminal depth resides with the port authority or private entity operating that facility. This joint responsibility provides challenges for those private entities needing additional access that does not fall within the responsibility of the Federal Government. These dredging projects generally also have additional financial matching requirements for the port authority or private entity operating the port.

While the Fargo-Moorehead diversion project is not port specific, the mechanisms used may be applicable. As previously discussed, the Fargo-Moorhead diversion project is a USACE demonstration project for alternative financing and delivery in North Dakota and Minnesota. The project will be delivered in two parts with the local sponsors leading a public-private partnership (P3) that will complete the 30 mile diversion channel and associated infrastructure, with the Federal Government leading the construction of a southern embankment. This innovative approach will allow each of the project pieces to be delivered in parallel.

Multiple financing tools, including a mix of public and private financing, will be used to deliver the project. The Federal portion of the project will be funded through Federal appropriations with the local sponsor's portion (P3) being funded through state Appropriations, three voter-approved sales taxes, and utilization of an improvement district. The voter-approved sales taxes add up to 1.5 cents and are anticipated to be able to cover all pay-as-you-go and debt services for the contract. The Improvement District, a defined physical area with business or other services, which allows for special assessments, or taxes, is used as a financial backing mechanism allowing more flexibility and better rates on publicly issued bonding. The combination of state appropriations, sales tax revenue, and Improvement District backing provide a very robust financing package for the project.

Although this project is considered a demonstration project, the financial mechanism and structures leveraged to finance different components of the project are not unique to this project. As the project progresses, it may be a valuable source for best practices that could inform the planning efforts of other cities, states, and regions looking to leverage innovative finance approaches. USACE is also pursuing a handful of other alternative financing projects that are currently in various stages, including a project on the Illinois Waterway exploring the use of alternative financing for O&M.

Section 2104 of the Water Resources Reform and Development Act (WRRDA) of 2014 (P.L. 113-121) expanded USACE authority under the existing Remote and Subsistence Harbor provision in the 2007 Water Resources Development Act (33 U.S.C. 2242) to support projects that fall outside the traditional national economic framework. WRRDA Section 2006 provides that in conducting a study of remote and subsistence harbor and navigation improvements, the Secretary of the Army may recommend a project without need to demonstrate that the project is justified solely by national economic development benefits if certain criteria are met. These criteria include: that the community to be served is at least 70 miles from the nearest surface accessible commercial point and has no direct rail or highway link served by those infrastructure assets, or that the improvements are located in Alaska, among other states; that the harbor is economically critical such that over 80 percent of the goods would be consumed within the region; and that the viability of the community would be threatened without the improvement. Recommendations for a project meeting the above criteria should also consider the public health

benefits, access to resources for subsistence purposes, local and regional economic opportunities, welfare of the local population and social and cultural value to the community.

Although WRRDA does not grant explicit P3 capabilities or financial support, it provides flexibility in determining the national economic benefits of development in Alaska, the necessity of which can be one of the barriers to a successful P3. The WRRDA may provide an avenue to pursue non-traditional financing and investment arrangements, previously unavailable in the region.

Additional opportunities for partnerships can include in-kind matches for financial investment by other sectors. For example, it may be possible to explore whether land use rights and/or land ownership can be leveraged for infrastructure development (e.g. publicly owned land leased and used for private development).

The U.S. Maritime Administration (MARAD) has a Port Conveyance Program applicable to agencies and departments of the Federal Government that own property that is no longer required due to programmatic changes, relocation of resources, or other operational changes. The Federal Property and Administrative Services Act of 1949, as amended, provides for the disposal of excess real property to other executive agencies that have a need for the property, or, if there is no such need, for disposal as surplus property.⁴⁹ This program has already been used in Alaska by the City of Dillingham to support the expansion of their Small Boat Basin. In 2003, MARAD conveyed 2.38 acres of land that were formerly operated by the Department of the Army to the City of Dillingham.

There are other mechanisms for acquiring port property. Congress passed legislation on February 1, 2016 which included language that authorized the transfer of Port Clarence to the Bering Straits Native Corporation (BSNC), the State of Alaska, and the retention of property by the U.S. Coast Guard. President Obama signed the legislation into law on February 8, 2016. One goal of the law is to facilitate infrastructure development and potential uses of Point Spencer, adjacent to Port Clarence, Alaska. Subtitle C of Title V of the 2015 Coast Guard Reauthorization Act specifically conveyed portions of the 2,400 acre tract at Point Spencer to BSNC and the State of Alaska.⁵⁰

Existing public ports in the Arctic have built valuable capacity for operations and represent important ongoing investments as existing infrastructure that can economically be developed as critical Arctic infrastructure available immediately. The Port of Nome has taken significant community resources in its development and has been successful in private partnerships that

⁴⁹ MARAD Port Conveyance (46 CFR § 387.2.). Available at: https://www.marad.dot.gov/wp-content/uploads/pdf/PCP_--_46_CFR_387.pdf.

⁵⁰ Coast Guard Authorization Act of 2015. Available at: <https://www.congress.gov/bill/114th-congress/house-bill/1987>.

include Alaska Native Corporations. Recently the Port of Nome was identified in the USACE Arctic Deep-Draft Port Study. The Nome project offers potential opportunities to propose various recommendations for hybrid or non-traditional financing alternatives that would be examples for infrastructure development throughout the Arctic.

Based on these examples, there are numerous avenues that can be explored for deep-draft port development in Alaska. While none of these are a direct path, the variety of options and ingenuity shown in financing, land acquisition, and economic justification should be explored to the fullest extent possible to identify any collaborative opportunity where P3 or non-traditional financing could be applicable.

Arctic Port Reception Facilities

Recommendation: *Prioritize the need for Arctic port reception facilities to support international regulatory needs and future growth.*

As maritime activity within the Arctic increases, it has been met with increased attention on safety, security, and environmental stewardship. The International Maritime Organization (IMO) Marine Environment Protection Committee (MEPC) and its subcommittees developed The Polar Code (Resolution MEPC.264(68)), which comes into force January 1, 2017, to address some of these concerns. One of the specific provisions in Polar Code amendments to the International Convention for the Prevention of Pollution from Ships (MARPOL) relates to discharge restrictions of operational wastes from ships and will require major considerations for the maritime industry.

One challenge to implementing these regulations is the lack of infrastructure available in some areas of the Arctic to meet the needs of commercial vessels to offload waste. The creation of a regional arrangement (RA) is one approach that may allow Arctic countries and Arctic ports servicing ships calling at ports, or departing for/returning from Arctic regions, to provide adequate reception of MARPOL wastes without undue delay to ships.

There are a number of potential waste management challenges under MARPOL for ships operating in Arctic regions which may include:

1. Annex I oily waste: discharge prohibited (all) and must be retained on-board;
2. Annex II, Noxious liquid substances (NLS) or NLS mixtures: (all) must be retained on board;
3. Restrictions for discharges of sewage near land, fast ice, or ice shelf; and
4. Some or all Annex V wastes may need to be retained onboard. Additional restrictions exist for cargo residues and cargo hold wash water.

Additional unique operational challenges for both ships and ports may include longer routes between ports, more days at sea due to weather delays, port closures, changing ice movements and local ice conditions. Logistics and costs to install and operate waste collection, storage, treatment and disposal equipment and technologies in remote Arctic areas are additional challenges, as is the potential need for ships to deviate from planned routes to make use of a specific port reception facility (PRF). All of this is compounded by the potential for too few ships calling at ports which may diminish economic viability and sustainability of individual facilities, but which also may create opportunities, regionally, for government and/or private sector support.

A regional ship waste management strategy could include a regional reception facility plan which could take advantage of formal or informal agreements, including near-Arctic waters facilities. Such near-Arctic ocean areas could include waters adjacent to both Arctic countries and near-Arctic countries falling outside the Polar Code definition.

Benefits of a regional approach may include minimizing the risks associated with waste disposal facilities which are located in remote regions or are only operational seasonally allowing for sharing of waste management resources, infrastructure costs, and maintenance costs. They may also be more attractive to investors as the potential financing partnerships would be regionally based and, depending on the locations included in the agreements, include facilities that are available year-round as well as seasonally, thus minimizing risks and maximizing potential users.

Energy Availability

Physical infrastructure needs are not limited to channels, berths, and piers. Maritime infrastructure also requires reliable energy to support port, community, and regional activities. In areas as remote as Alaska, energy security can be a challenge. Enhancement or growth in commercial activities will require sufficient upland infrastructure (adjacent or proximal to waterfront operations) to facilitate the anticipated expansion. Without concurrent development in support capabilities like energy, commercial investment in port infrastructure and facilities may not produce the desired outcomes.

The U.S. Department of Energy (DOE) is engaged in a number of areas supporting P3 and other financing mechanisms. While their P3 programs are primarily terrestrially focused, the underlying principles of cooperation and cost sharing could be applied to a range of possible projects supporting Alaska Arctic maritime infrastructure.

For example, the DOE Office of Energy Efficiency and Renewable Energy (EERE) recognizes the critical role public-private partnerships play in accelerating the transition to a clean energy

economy.⁵¹ The Small Business Vouchers (SBV) pilot program was launched in March 2016, with an initial award to 33 small businesses. With 23 million small businesses currently operating in the U.S., the pilot is heavily targeted in attracting companies that typically would not have access to the scientific expertise and resources of the Department's national laboratories. The SBV pilot makes it possible to direct the power of the national laboratories toward specific problems identified by small businesses by pairing these companies with a national laboratory uniquely qualified to solve their challenges.

SBV is a collaborative, national effort that provides \$20 million for U.S. companies to help improve industry awareness of national laboratory capabilities and provide small and mid-size businesses access to the resources available within the national laboratory system. These collaborations focus on a number of areas, one of which is wind; two projects in the wind area will develop methods for integrating wind power into existing power grids, in addition to developing new methods of diagnosing damage to turbines.⁵²

DOE also published a report on Energy Investment Partnerships in December 2015.⁵³ This document compiles examples of state and local government mechanisms in use creating P3s in their community or region to support clean energy investment. By developing P3s and bringing the appropriate mix of partners, authorities, and strategies to the table, each state, region, municipality, and market can create a unique—but effective—vehicle to support clean energy finance and deployment. The implementation of these entities, described as “Energy Investment Partnerships (EIPs),” and sometimes referred to as “Green Banks,” is typically a result of carefully structured public-private partnerships, cooperative political environments, legislative mandates, and access to credit enhancement tools.

By leveraging private dollars, EIPs generate an impact well beyond what would be possible with public funds alone. Programs across the country are showing how these lending programs can leverage public dollars to increase investment in clean energy. Through issuing bonds, authorities in Connecticut and New York have sold clean energy loan portfolios on the secondary market. Florida’s nonprofit Solar and Energy Loan Fund (SELF) in St. Lucie County has leveraged private dollars into clean energy loans for low and moderate income (LMI) individuals by working with private banks’ Community Reinvestment Act (CRA) divisions and the Community Development Finance Institution (CDFI). In 2015, the State of Rhode Island passed

⁵¹ U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, *Empowering Small Businesses to Expand the Clean Energy Revolution*, (Aug. 18, 2016). Available at: <http://energy.gov/eere/articles/empowering-small-businesses-expand-clean-energy-revolution>.

⁵² U.S. Department of Energy, Office of Energy Efficiency & Renewable Energy, *Energy Department Awards 43 new Business-Laboratory Collaborations under Small Business Vouchers Pilot*, (Aug. 18, 2016). Available at: <http://energy.gov/eere/articles/energy-department-awards-43-new-business-laboratory-collaborations-under-small>.

⁵³ U.S. Department of Energy, *Energy Investment Partnerships: How State and Local governments are Engaging Private Capital to Drive Clean Energy Investment*. Washington, 2015. Available at: <http://energy.gov/sites/prod/files/2015/12/f27/Energy%20Investment%20Partnerships.pdf>.

legislation for the Rhode Island Infrastructure Bank, and Montgomery County, Maryland, also passed legislation for a “Green Bank”—both entities are now moving forward in their development.

The State of Alaska has the Alaska Energy Authority (AEA), an independent corporation governed by a board of directors with the mission to “reduce the cost of energy in Alaska.”⁵⁴ Created by the Alaska Legislature in 1976, AEA is the state's energy office and lead agency for statewide energy policy and program development. According to the AEA’s formative statute, “The purpose of the authority is to promote, develop, and advance the general prosperity and economic welfare of the people of the state by providing a means of financing and operating power projects and facilities that recover and use waste energy and by carrying out the powers and duties assigned to it under AS 42.45.” Alaska Stat. § 44.83.070 (2014).

The AEA administers a number of programs and projects including the Emerging Energy Technology Fund supporting demonstration projects that develop and test new energy technologies, as well as old technologies that have yet to be implemented in Alaska.⁵⁵ The Power Project Fund provides financing to smaller, local electric utilities for various projects, including waste-to-energy projects, energy conservation and energy efficiency projects, and alternative energy facilities and equipment.⁵⁶

Leveraging existing programs and finding ways to adapt them to the infrastructure needs of a port community may provide a first step toward ensuring the upland infrastructure exists to expand the maritime capabilities. Communities like Nome, which have started developing wind energy capabilities, face issues with finding a way to store excess wind energy generated, by no means a unique challenge. Creating the infrastructure and support for these kinds of investments in Nome and elsewhere also builds a foundation of best practices that can be shared and leveraged by other communities. Combining the benefits of grant and finance programs may provide more flexibility for small communities to increase their infrastructure stability and energy security and grow their maritime economies.

Waterways Management

Marine Highways

Recommendation: *Designate M-5 Alaska Marine Highway Connector to connect the Arctic Ocean and the western section of the Northwest Passage.*

⁵⁴ State of Alaska, Alaska Energy Authority. Available at: <http://www.akenergyauthority.org/>.

⁵⁵ State of Alaska, Alaska Energy Authority. Available at: <http://www.akenergyauthority.org/About>.

⁵⁶ *Id.*

America's Marine Highway System consists of over 25,000 nautical miles of navigable waterways including rivers, bays, channels, the Great Lakes, the Saint Lawrence Seaway System, coastal, and open-ocean routes. The Marine Highway Program works to further incorporate these waterways into the greater U.S. transportation system, especially where marine transportation services are the most efficient, effective, and sustainable transportation option. In the Arctic, marine transportation is one of the only options for moving goods over long distances; for large items or bulk goods that cannot travel by air, it is the only option.

A designation of a Marine Highways Route is an acknowledgement by the Secretary of Transportation that it is part of the larger surface transportation system. It is important to identify operators who are eligible to apply for designation as a Marine Highway Project. Approved designations become eligible for Marine Highway Project Grants. The ports and cities along a route can work with shippers, vessel owners, and other public and private entities to develop projects for designation by the Secretary. These proposals can bring further focus to the regional efforts and entitles them to apply for grant funding, when appropriated. The industry plays the biggest role in the process. The public entities will be the sponsor of the project; however, private businesses are the key to making it work. The grants are to cover infrastructure deficits, but not operating subsidies, so the private partners and stakeholders have to provide the capital and the freight to make the project successful.

There are examples of Marine Highway Grants that while, not located in the U.S. Arctic, are providing services and improvements that have been identified as needs in the region. For example, the James River Container Expansion Project is designed specifically to develop new customers by providing additional services, including the expanding capacity to include refrigerated and frozen products. The New York Harbor and Container and Trailer on Barge Service is another example where the funding will be used to improve barge operations through purchasing infrastructure and providing training for crane operations which improve both safety and throughput. These types of infrastructure and service expansions may be applicable to U.S. Arctic and could provide the opportunity for application of P3.⁵⁷

MARAD, which manages the Marine Highway program, will work together with the State of Alaska and tug and barge operators to identify those eligible to submit for Designation as a Marine Highway Project. Those designated will be eligible to apply for Marine Highway Project

⁵⁷ America's Marine Highway Program available at https://www.marad.dot.gov/newsroom/news_release/2016/maritime-administration-awards-4-85-million-in-grants-for-marine-highway-projects/ as of November 2016

funding as it becomes available which can cover construction and could serve as the foundation for further operate and maintain agreements in the form of P3.⁵⁸

Charting and Observations

Recommendation: *Support and coordinate collection and sharing of observations and data for waterways management and vessel routing requirements.*

The Arctic remains an intensely harsh operating environment, and even as marine transportation-dependent activities and development increase, so too do the significant risks of accident and injury to people and fragile ecosystems in Alaska and the wider Arctic region. Therefore, updated nautical charts, and observations for safe navigation are essential if the U.S. Arctic Marine Transportation System (MTS) is to be capable of meeting the region's safety, security, economic development, and environmental protection needs. There are six components that underpin the delivery of essential navigation services to Arctic users: the foundational geodetic and water levels infrastructure, hydrographic surveying, shoreline mapping, other ocean observations that factor into decisional support and the nautical charts themselves. Each component is interdependent upon the next in order for the National Oceanic and Atmospheric Administration (NOAA) to deliver an integrated suite of services to Arctic Alaskan residents, industries and mariners for safe navigation, as well as for environmental protection. Accurate nautical charts will also facilitate any future designation of subsistence use areas, marine protected areas, seasonal migration routes and other ecologically relevant areas. Moreover, the data supports Arctic coastal community resilience, as it feeds into storm surge models, erosion assessments and sea level change studies.

Although over half of U.S. Arctic waters are classified as navigationally significant (242,000 square nautical miles), only about 6000 square nautical miles of this area (about 2 percent) has been surveyed with modern multibeam technology. There are only 28 Continuously Operating Reference Stations (CORS) Network sites along and north of the Aleutian Chain (as compared to roughly 2000 in the Lower 48 states) and only ten National Water Level Observation Network (NWLON) tidal stations with 20 additional gaps identified through analysis and stakeholder engagement.

NOAA contracts for some of its hydrographic and shoreline data acquisition, and for services to install and maintain its NWLONs and CORS. NOAA also works collaboratively with partners to leverage resources to acquire more data or test and develop solutions to Arctic equipment issues. Possible other partnership opportunities include cost-sharing for additional Arctic NWLON installation and maintenance. There is potential for collaboration and data sharing among private

⁵⁸ U.S. Department of Transportation, Federal Aviation Administration, *Notice of Request to Release Airport Property*. 81 Fed. Reg. 22700. Washington, 2016. Available at: <https://www.gpo.gov/fdsys/pkg/FR-2016-04-18/pdf/2016-08869.pdf>.

and public entities to fill in the data gaps on nautical charts following the Integrated Ocean and Coastal Mapping approach to “map once, use many times.” A survey company has indicated its support for collaborating on innovative hydrographic surveying to address the data and charting needs in the U.S. Arctic. NOAA’s Policy on Partnerships in the Provision of Environmental Information” (NAO 216-112) recognizes the significant information produced by the commercial and academic sectors and supports and the benefits of these products. NOAA’s Big Data Project is facilitated through a series of CRADAs with Amazon Web Services, Google Cloud Platform, IBM, Microsoft Corp., and the Open Cloud Consortium and explores ways to share environmental data on cloud-based platforms.

Satellite AIS Capabilities

Recommendation: *Expand partnerships to provide new satellite AIS capabilities for offshore activity information.*

The Marine Exchange of Alaska (MXAK) provides critical route planning and vessel monitoring support to mitigate the risks and impacts presented by increased maritime traffic in the Arctic. They have self-supported AIS sites located throughout the state. MXAK is a non-profit maritime organization established to serve the Alaska maritime community by providing information, communications, and services to ensure safe, secure, efficient, and environmentally responsible maritime operations. MXAK is funded by the maritime industry, the USCG, and the State of Alaska, providing a classic P3 that capitalizes on the shared commitment to enhance maritime safety. There is a network of 130 land-based AIS receiving stations throughout the State of Alaska operated by the MXAK; 60 are in Arctic waters. MXAK uses this AIS data for domain awareness, risk mitigation, and navigation planning to support the regional maritime community.

Currently, USCG has a cooperative agreement with MXAK to obtain AIS positional information from their shore-based receivers. Because the network is owned and operated by MXAK, the USCG is a consumer of the output of that service. It may be possible to augment the current system to track vessels operating further offshore through partnering with an additional service offered by MXAK as well as other potential providers in the area. This could further enhance risk mitigation, the prevention of maritime accidents, and environmental impacts caused by vessels operating in Arctic waters. Through identifying unique information gaps and technology solutions, it may be possible to create partnerships that can leverage both private and public investment.

Emergency Response

Aviation

Recommendation: *Continue collaboration with state and local authorities to ensure readiness of Arctic maritime and aviation infrastructure for emergency response and SAR.*

Aviation is a vital component of Alaska's transportation system. Whether one lives in Anchorage or the smallest community at the tip of the Aleutians, air service is the lifeline that connects all Alaskans to other communities in the state, to the Lower 48, and to the world. Alaska's airports serve the transportation needs of the state's residents, support the movement of materials and goods, contribute substantially to the economy, and enable delivery of critical medical services. Nearly 82% of Alaska communities are not accessible by road, making aviation more than a convenience or a luxury - aviation is essential in the Alaskan way of life. Alaska has six times as many pilots per capita and 16 times as many aircraft per capita when compared to the rest of the United States and the Alaska Department of Transportation & Public Facilities owns 247 rural airports all key assets for connecting communities and resources in the state.⁵⁹

Airports are also key connectors for responding to emergency situations. It is over 1000 miles by vessel to travel from Kodiak, AK to Barrow, at the top of Alaska and would take a number of days to complete the transit. It takes the U.S. Coast Guard approximately 6 hours to fly from Kodiak on a direct flight to Barrow in the event of an emergency. The reliance on aviation infrastructure to move supplies and people for response services highlights the need for reliable infrastructure to enable these critical response capabilities.

An airport Master Plan or Airport Layout Plan update is the primary means by which airport sponsors and the Federal Aviation Administration (FAA) evaluate the current and future needs at an airport. The projects identified through the planning process vary widely. Examples include infrastructure improvements to meet airport design standards, shore protection from erosion, apron/lease lot development and occasionally runway relocations due to damage caused by significant coastal erosion/storm surges. Funding comes from either Federal or non-Federal sources depending on the type of work involved. The FAA works with these airports in the development of a capital improvement plan that addresses and prioritizes airport development needs for the overall aviation system within the State of Alaska. Some of the factors the FAA considers when prioritizing projects for AIP grant funding include: eligibility, justification, national priority ranking, cost, and ability to deliver the project (meeting environmental and design requirements).

The Barrow airport master plan update is one example where security and emergency response was a consideration. The United States Coast Guard (USCG) had requested to place assets at

⁵⁹ State of Alaska, Alaska Department of Transportation & Public Facilities, Division of Statewide Aviation. Available at: <http://dot.alaska.gov/stwdav/index.shtml>.

the airport in response to increased oil and gas exploration and increased marine traffic in the area. This prompted the airport to identify an area on the airport for a future USCG hangar and ramp space to support future search and rescue efforts in the area.

Special grant assurances that apply to an airport owner make P3 difficult to implement. There would need to be a review of the proposed P3 project with respect to ensuring the airport owner can continue to satisfy these grant assurances. All project costs (and assigned funding) would need to be clearly delineated; this ensures that Airport Improvement Program (AIP) funding is utilized strictly for items that it is authorized for, and it allows for the FAA to ensure usable development is being built in accordance with applicable standards at a reasonable cost.

Although there have not been any P3 airport projects in Alaska, there have been some limited examples of other Federal and non-Federal agencies financially participating in the development of an airport project. The high cost of the Akutan airport project, at approximately \$77M, prompted the State of Alaska Department of Transportation, the Aleutians East Borough and the City of Akutan to enter into a project co-sponsorship and collectively obtain other non-FAA funds for the project. They were successful in securing additional funds from the Federal Highway Administration, City of Akutan, the U.S. Economic Development Administration, Trident Seafoods, the East Aleutians Borough and the State of Alaska to close the funding gap for the project.

The Ketchikan airport is another unique arrangement; it is owned by the State of Alaska but operated by the Ketchikan Gateway Borough, a government enterprise fund. The goal for the airport is to be self-sustaining. Unlike other airports in Alaska, the Ketchikan airport charges landing fees for planes, something that is also done throughout the lower 48. While this arrangement is not a traditional P3, it serves as an interesting example of innovative public-private arrangements that could be leveraged elsewhere to support critical infrastructure.

One option to help support aviation infrastructure could be the FAA's Airport Privatization Pilot Program. This program was created by Congress and began in September 1997 to explore privatization as a means of generating access to various sources of private capital for airport improvement and development. Private companies may own, manage, lease and develop public airports. The 2012 Reauthorization Act increased the number of airports than can participate from five to 10. The Act authorized FAA to permit up to 10 public airport sponsors to sell or lease an airport with certain restrictions and to exempt the sponsor from certain Federal requirements that could otherwise make privatization impractical.⁶⁰

It may be beneficial to review Alaska airport locations that would be considered critical infrastructure nodes during an emergency response situation and explore the possibility of using

⁶⁰ Department of Transportation, Federal Aviation Administration, Airport Privatization Pilot Program. Washington, 2014. Available at: http://www.faa.gov/airports/airport_compliance/privatization/.

the FAA program or similar to ensure that airport infrastructure is sufficient to support a large scale response.

Additional benefits of these kinds of investments could include auxiliary benefits to the communities serviced by those regional or local airports through increases in flight and goods movement capacities. Given the limited options for shipping goods in Alaska, enhancing the underlying support infrastructure could produce benefits for several sectors.

Technology Development

There are potential opportunities for research and development (RD) cooperative projects which could leverage both the needs of the Government and communities with the talents and funding of private industry. For example, the Anchorage-based Alaska Maritime Prevention and Response Network, a non-profit organization, is collaborating with several companies to develop a prototype ship arrestor - essentially a massive, underwater parachute, designed to slow or stop a large ship if an incident causes it to start drifting.⁶¹ In this case, the technology may not be something vessels keep aboard, but rather a tool that can be stationed as part of a response network in the region, within communities including at ports and other locations that would facilitate its deployment. The system could then be delivered to a vessel in distress by either another vessel or by aircraft in instances when a tugboat isn't available to help. While not a traditional P3, the development of these kinds of technologies, which can ultimately be marketed back to governments and the private sector, provide an opportunity for the return on the investment needed to get critical technology to market. There may be additional opportunities where known technology gaps can be leveraged through investment partnerships that are then able to market the resulting products.

Both the U.S. and USCG Arctic Strategies stress the important role that public-private partnerships will play in developing the critical infrastructure needed for effective, efficient, and safe operations in this emerging remote and hostile environment. To that end, the Coast Guard Research and Development Center (RDC) has entered into a CRADA with MXAK to promote a public-private analysis and potential options for a “Next Generation Arctic Navigational Safety Information System.”

The mission need is reliable critical navigational safety information to identify, assess, and mitigate navigational risks in the Arctic region. The RDC’s objective is to define, develop, demonstrate, and evaluate, in an operational setting, at least one promising technology approach to the “Next Generation Arctic Maritime Navigational Safety Information System.” The goal is

⁶¹ Annie Zak, *An Alaska nonprofit is developing a massive underwater parachute for big ships*, Alaska Dispatch News, (May 17, 2016). Available at: <http://www.adn.com/alaska-news/article/alaska-nonprofit-making-massive-underwater-parachute-big-ships/2016/04/01/>.

to provide time-critical information to mariners so that they may better assess and manage their voyage risks as they transit the U.S. Arctic Exclusive Economic Zone (EEZ).

Via a 5 five-year CRADA, the RDC and MXAK will collaborate to design, develop, test, and evaluate, within the U.S. Arctic EEZ waters, at least one technology approach to the “Next Generation Arctic Maritime Navigational Safety Information System.” This Technology Demonstration (Tech Demo) is anticipated to be conducted over several Arctic shipping seasons. The RDC will document the results of this prototype system(s) so that the insights gained can be incorporated into future maritime safety systems, which conform to future USCG and IMO policies and requirements, whether they be owned/operated by private or government entities.

Oil Spill Response Capability

Recommendation: *Develop on-shore facilities for oil spill response (e.g. hazardous/oily waste disposal, wildlife response, responder housing).*

The Alaska Regional Response Team guides the contingency planning efforts for the Federal and state response to oil spills, in partnership with maritime industry and local stakeholders. The logistics required to move response equipment and personnel is a challenge in the Arctic region. Industry has a major responsibility in the staging and moving of equipment to respond to oil spills. P3s can play a role during the identification of capability gaps in local response planning and addressing potential mechanisms to close those gaps to strengthen capability.

The oil and gas industry, shipping companies, mining and fishing enterprises, adventure tour operators, and others, seeking gains in the Arctic serve critical roles, especially with respect to pollution prevention and response. The “polluter pays” principle, emphasized in the Oil Pollution Act of 1990, is a motivating factor and corresponding requirement for all operators to do all possible to prevent harm and everything necessary to lessen their environmental impact. The USCG, Department of Homeland Security, Department of the Interior, Environmental Protection Agency, NOAA, Department of Transportation, Department of Defense, and other government representatives must work together with industry and others in the private sector to identify and implement best practices to prevent and respond to challenges in the region. This effort may require innovate funding schemes to ensure appropriate Federal presence.⁶²

Active engagement and partnership with Alaskan populations, including Alaska Native Corporations can increase response capabilities in the instance of an oil spill. These communities may be the first responder in an emergency. For example, the Sitnasuak Native Corporation operates Bonanza Fuel, LLC, as a subsidiary that manages the largest bulk fuel storage facility in Nome. Bonanza Fuel also has oil spill response capacity for the benefit of the Port of Nome.

⁶² U.S. Coast Guard, *Arctic Strategy*, Washington, 2013. Available at: https://www.uscg.mil/seniorleadership/DOCS/CG_Arctic_Strategy.pdf.

Arctic Oil Spill Response Research (OSRR) projects are examples of how the Bureau of Safety and Environmental Enforcement (BSEE) has and continues to address the ongoing operational and environmental concerns associated with energy exploration and exploitation in the Arctic. OSRR projects are advancing collective knowledge of oil spill response capabilities in cold water environments, and are important to ensure that the U.S. is prepared for an oil spill response in the harsh Arctic environment. Examples of the funded projects range from oil skimmer technologies that recover spilled oil to polymer technology to absorb the oil and provide storage options.

Programs like this build the base for technology development and demonstration, which could take the form of P3 or similar financing arrangements. Continued collaboration with state and industry stakeholders to identify highest priority locations for oil spill preparedness growth/development is key to making sure the equipment currently existing, or underdevelopment, is distributed in the most effective manner and paired with the communities most able to respond in the event of an incident.

Search and Rescue

No single agency or nation has the sovereignty, capacity, or control over resources necessary to meet all emerging challenges in the Arctic. A strong network of partnerships is required to deliver the platforms, people, and protocols necessary to secure the region against transnational threats, facilitate legitimate commerce, and protect the environment. The U.S. Coast Guard (USCG) will seek out new areas of mutual interest to build strategic partnerships which promote innovative and affordable solutions, and enhance burden-sharing throughout the region. These efforts must be collaborative with the private sector and international partners to amplify capabilities, enhance operational effectiveness, and establish a balanced and capable future force construct.

In August 2012, AIDEA was approved to construct, own, and operate a facility, an expansion of the existing National Guard Armory, for use by the USCG on Joint Base Elmendorf and Richardson (JBER). Specifications for the Camp Denali Readiness Center Addition Project (CDRCAP) were presented to AIDEA in a USCG document entitled, “USCG Sector Anchorage Facility Requirements”, in June 2011. Using funds provided via a Reimbursement Services

Agreement to AIDEA from the Department of Military and Veteran's Affairs (DMVA), AIDEA retained a consultant to advance these specifications to a design level.⁶³

Through the Project Development and Operations Agreement, the DMVA is responsible for payments to AIDEA, subject to future legislative appropriations. In a separate agreement between the DMVA and the USCG, DMVA will be responsible for the operations and maintenance of the facility and the USCG will pay the DMVA directly for this effort.

This project was paid for with funds from AIDEA's Economic Development Fund. The Memorandum of Agreement (MOA) between the USCG and the DMVA provides a payment of \$1.1 million annually to AIDEA. This building is leased for 30 years from AIDEA to the DMVA who subleases the building to the USCG.

This project fulfills AIDEA's mission of economic development and job growth by creating up to 80 new jobs during the facility construction, retaining over 115 USCG military and civilian jobs in the Anchorage area and adding other jobs through consolidation of USCG billets from around the state to the new facility. Housing the USCG at the Camp Denali Readiness Center facility will enhance the cooperative efforts serving Alaska by strengthening interagency relations between the Department of Defense, the State of Alaska and the USCG. Due to the location of the Readiness Center addition, it will also facilitate synergy between the USCG and the Army/Air Guard through shared training classrooms and the medical clinic.

⁶³ State of Alaska. Alaska Industrial Development and Export Authority, Camp Denali Readiness Center Addition. Anchorage, 2016). Available at: http://www.aidea.org/Portals/0/PDF%20Files/PFS_CampDenali.pdf.

CHAPTER V: INNOVATIVE FINANCING TO MEET U.S. ARCTIC NEEDS

P3s are one method of project financing that require specific economic and regulatory environments to be feasible. For the purpose of this report, there is an assumption of feasibility. In this chapter, other forms of innovative financing that could be implemented in the U.S. Arctic are briefly explored.

Innovative financing can encompass all aspects of the infrastructure investment process, from the predevelopment/seed-money phase, to consideration of non-traditional forms of P3s, as well as hybrid financing approaches that allocate demand risk between the public and private partners.

Predevelopment or Project Preparation

Predevelopment includes such activities as project planning, feasibility studies, cost-benefit analyses, design and engineering, financial planning (including the identification of funding and financing options), permitting, an assessment of community and environmental impacts, and public outreach and community engagement.⁶⁴ Although only accounting for a small percentage of overall project costs, the predevelopment phase largely defines how projects will be paid for and built, and is the point in the investment process at which some of the most critical best practices are implemented. Predevelopment analysis is particularly essential for P3s, both to assess whether P3 funding can save money for taxpayers over the project lifecycle compared to conventional procurement, and because the quality of project preparation can have a considerable effect on a P3's long-run financial viability.

As an example of one approach to predevelopment, Canada established a Project Development Fund (PDF) in 2013 through its centralized public-private partnership unit, PPP Canada. The PDF supports inexperienced jurisdictions with the affordability of the upfront development work required in order to properly determine which procurement option is best suited to their project – conventional or P3. Applicants are eligible for up to 50% cost sharing to receive reimbursement to assist them in undertaking and completing necessary predevelopment work, including identification of risks and optimal risk sharing strategies.⁶⁵

⁶⁴ U.S. Department of Housing and Urban Development, Build America Investment Initiative, *Federal Resource Guide for Infrastructure Planning and Design*. Washington, 2015. Available at: <http://portal.hud.gov/hudportal/documents/huddoc?id=BAInfraResGuideMay2015.pdf>.

⁶⁵ Lew & Foxx, U.S. Department of the Treasury & U.S. Department of Transportation, Recommendations of the Build America Investment Initiative Interagency Working Group. Washington, 2015. Available at: <https://www.treasury.gov/resource-center/economic-policy/Documents/Build%20America%20Recommendation%20Report%201-15-15%20FOR%20PUBLICATION.pdf>.

The United States does not have a centralized public-private partnership unit at the national level (though such units exist in several states), nor does it have a centralized project development fund to support predevelopment work. At the Infrastructure Summit hosted by the Department of the Treasury and Department of Transportation in 2014, two philanthropic organizations, the Ford Foundation and Rockefeller Foundation, announced they would provide an initial joint investment of over \$1 million to support the launch of a predevelopment fund for cutting-edge projects, and to provide seed capital for regional collaboration models such as regional infrastructure exchanges.⁶⁶ Consideration might be given to setting up an Arctic-region infrastructure exchange.

Despite initial efforts of philanthropic organizations, the major challenge remains: Project sponsors undertaking innovative infrastructure projects – whether innovative in terms of using emerging technologies or P3 financing – lack sufficient funding for the early phases of infrastructure project development that precede actual construction. The Build America Recommendations Report sent to the President in January 2015 concluded that state and local government project sponsors need expanded access to predevelopment funding for infrastructure projects, and recommended identifying opportunities for connecting state and local-based projects with complementary Federal predevelopment resources. The report also advised that predevelopment opportunities within Federal programs should be explored, and that a better understanding of the role that the private sector could play in supporting P3 project predevelopment was necessary.⁶⁷

Based on these recommendations, the President issued a memorandum in January 2015 instructing relevant agencies to issue guidance on their development-related grant programs and ordering a coordinated outreach and technical assistance campaign to educate state and local governments on the benefits of predevelopment funding for non-Federal P3 projects. In May, the White House, Ford Foundation and the Rockefeller Foundation jointly hosted a Roundtable with leading thinkers on infrastructure planning and design on how to plan and design

⁶⁶ National Council for Public-Private Partnerships, White House, Philanthropic Organizations Announce Major P3 Programs at Summit, (Sept. 10, 2014). Available at: <http://www.ncppp.org/white-house-philanthropic-organizations-announce-major-p3-programs-at-summit/>; Robert Puentes, et al., KKR, *The Way Forward: A nEW Economic Vision for America's Infrastructure*. Washington, 2014. Available at:

http://www.kkr.com/_files/pdf/KKR_New.Economic.Vision.for.Americas.Infra_052014.pdf. (An example of a regional exchange is the West Coast Infrastructure Exchange (WCX) that is partially supported by the Rockefeller Foundation. Launched in 2012 by California, Oregon, Washington and British Columbia, its goal is to develop innovative infrastructure financing approaches and to protect the quality of life along the Pacific Coast.)

⁶⁷ Lew & Foxx, U.S. Department of the Treasury & U.S. Department of Transportation, *Recommendations of the Build America Investment Initiative Interagency Working Group*. Washington, 2015. Available at: <https://www.treasury.gov/resource-center/economic-policy/Documents/Build%20America%20Recommendation%20Report%201-15-15%20FOR%20PUBLICATION.pdf>.

infrastructure to foster economic opportunity and increase resilience to climate change.⁶⁸ An output of the roundtable was publication of the Federal Resource Guide for Infrastructure Planning and Design.⁶⁹ The Guide describes the role of predevelopment in the infrastructure investment process, lays out guiding principles, and presents case studies on how the Federal government has partnered with state and local governments on predevelopment activities. Importantly, the Guide provides an extensive list of Federal agency resources that support predevelopment through funding and technical assistance.

The Guide is an extremely valuable resource that can be utilized for Federal P3s for Arctic infrastructure projects, and may help projects maximize the benefits that can be obtained from available resources (e.g. it indicates if one Federal resource can be used as a match for other Federal funds). In addition, the Guide may foster efficient coordination across infrastructure sectors.⁷⁰ The report also describes which types of predevelopment assistance can be applied to state and local governments, tribes, private sector entities, non-profits, or communities, providing a roadmap for projects with multiple stakeholders.

Non-traditional P3s

Non-traditional P3s and certain complementary programs can potentially play a role in Arctic infrastructure investment as well, particularly in the area of broadband infrastructure.

For instance, as discussed in the Information Infrastructure section of this report, the Federal Communications Commission (FCC) created the Connect America Fund (CAF) in 2011, designed to connect all Americans to high-speed Internet wherever they live.⁷¹ CAF provides support to certain qualifying telephone companies that serve high-cost, primarily rural areas, ensuring that the residents of these regions have access to reasonably comparable service at rates reasonably comparable to urban areas. Working through a non-profit corporation that it created for this purpose, the FCC makes payments to telephone companies operating in high cost areas

⁶⁸ Jeffrey Zients & Christy Goldfuss, The White House, *Building for the Future: A New Federal Guide to Infrastructure Planning and Design*, (May 5, 2015). Available at: <https://www.whitehouse.gov/blog/2015/05/05/building-future-new-Federal-guide-infrastructure-planning-and-design>.

⁶⁹ U.S. Department of Housing and Urban Development, Build America Investment Initiative, *Federal Resource Guide for Infrastructure Planning and Design*. Washington, 2015. Available at: <http://portal.hud.gov/hudportal/documents/huddoc?id=BAInfraResGuideMay2015.pdf>.

⁷⁰ For example, the Guide states that under the Partnership for Sustainable Communities, HUD, DOT and EPA, along with other Federal agencies, coordinated investments and aligned policies using six shared principles across traditionally separate housing, transportation, and environmental issues. A similar approach might be applicable for the Arctic region.

⁷¹ Federal Communications Commission, FCC Creates Connect America Fund to Expand Broadband, Create Jobs, (Oct. 27, 2011). Available at: <https://www.fcc.gov/document/fcc-creates-connect-america-fund-expand-broadband-create-jobs>.

that enable them to cover the difference between what customers are able to pay for service and their costs. The subsidy payment can be thought of as being analogous to an availability payment because it includes specific service requirements and accountability that needs to be maintained in order to receive the funding. Although the assets remain privately held, they have a duty to provide a specified level of service in order to receive the public funds through the program.

This type of model could potentially be applied in the Arctic region, and possibly even for other types of infrastructure assets beyond telecommunications. However, the FCC recognized that private firms might not have an incentive to operate as cost efficiently as possible if they know they are going to receive a subsidy. Therefore, the agency developed a methodology to compare the costs of firms applying for the subsidy payment to the average cost of “similarly situated” firms, in order to avoid overpaying. If this type of model were to be considered for Arctic region projects, it would be incumbent upon project sponsors to determine if the data and analytics were available to establish similar safeguards and best practices.

Two complementary programs merit some discussion even though they are not P3s themselves, because of their potential to help steer financial resources to P3s. These programs are designed to encourage financial institutions to channel their resources to underserved, low income, or non-metropolitan communities in order to help improve the economic resilience and incomes of these communities. Recently, under the impetus of the Broadband Opportunity Council (BOC), these programs were modified to explicitly encourage investment in broadband infrastructure. Application to coastal communities in the Arctic would likely bring direct benefits to these areas and indirect spillover benefits to offshore assets utilizing this enabling technology.

The first program is the New Markets Tax Credit Program (NMTC), for which AIDEA has a loan guarantee assistance program. The NMTC Program attracts private capital into low-income communities by permitting individual and corporate investors to receive a tax credit against their Federal income tax in exchange for making equity investments in specialized financial intermediaries called Community Development Entities (CDEs). The credit totals 39 percent of the original investment amount and is claimed over a period of seven years. With these capital investments, CDEs can make loans and investments to businesses operating in distressed areas. In connection with the work of the Broadband Opportunity Council, the Community Development Financial Institutions fund (CDFI), which is part of the U.S. Department of the Treasury and which administers the NMTC program, recently clarified that loans and investments made by CDEs to support broadband infrastructure are eligible for NMTC investments, provided they meet certain IRS Regulations related to a business qualifying under

the NMTC program. This program guidance is now available to the public on the CDFI Fund's website with all of the NMTC Allocation Application materials.⁷²

The second program falls under the Community Reinvestment Act of 1977 (CRA) and is administered by the Office of the Comptroller of the Currency (OCC, an independent bureau of the U.S. Department of the Treasury) and other U.S. bank regulatory agencies. The CRA provides a framework for financial institutions, state and local governments, and community organizations to jointly promote banking services to all members of a community. The Act encourages efforts to meet the credit needs of all community members, including residents of low- and moderate-income neighborhoods. Under the Act, financial institutions are evaluated by the OCC and other regulators on how effective they have been in helping to revitalize or stabilize underserved nonmetropolitan geographies. In connection with the work of the Broadband Opportunity Council, the OCC recently included broadband investment as one of the factors it will consider when evaluating whether a financial institution has been effective in meeting essential community needs, thus providing an incentive for banks to make investments in this area.⁷³

Application of the Connect America Fund to improve the affordability of and demand for broadband in distressed areas, along with changes to the NMTC program and eligible CRA projects may lead to increased investment in broadband infrastructure in the Arctic region. Under these programs, financial institutions would have increased incentives to lend to or invest in P3s that are involved with building or rehabilitating communications infrastructure. It is important to keep in mind that broadband is an enabling infrastructure that can support many different applications and services, both public and private, from telemedicine and distance learning, to supporting search and rescue operations. The construction, operations and maintenance, and financing costs of new or rehabilitated broadband networks and services in Arctic coastal communities could potentially be shared by direct payments from local residential/business customers, Federal subsidy-availability payments, as well as payments by maritime assets (vessels and oil rigs) that would benefit from having access to this enabling technology. The details of compensation mechanisms are very important because they affect how demand risk is allocated between the public and private partners, and therefore the willingness of the partners to participate in a project.

⁷² U.S. Department of the Treasury, CDFI Fund, *New Markets Tax Credit Program: Allocation Application Frequently Asked Questions*. Washington, 2015. Available at: <https://www.cdfifund.gov/Documents/2015%20NMTC%20Application%20QA%20FINAL.pdf>.

⁷³ U.S. Department of the Treasury, Office of the Comptroller of the Currency, *Community Reinvestment Act; Interagency Questions and Answers Regarding Community Reinvestment Guidance*, 81 Fed. Reg. 48506. Washington, 2016. Available at: <https://www.gpo.gov/fdsys/pkg/FR-2016-07-25/pdf/2016-16693.pdf>. (The other bank regulators are the Federal Reserve System and Federal Deposit Insurance Corporation.)

Risk Sharing

Private investors and public sponsors may have different tolerances for accepting demand risk. As a result, allocating all of the demand risk to one party or the other can be an impediment to moving forward on a P3 transaction, if, for example, neither the public nor private partner is willing to assume *all* of the risk. For instance, a project may not proceed if it relies exclusively on user fees that shift all demand risk to the private sector, or on availability payments that allocate all the risk to the public sector. In contrast to the basic user fee and availability payments models, alternative P3 incentive structures can potentially align public and private sector interests in infrastructure provision and management by having both partners share in the project's downside risk as well as the upside potential. In other words, a middle ground is possible if the private investor is willing to relinquish part of the project's upside potential in exchange for getting some downside protection.⁷⁴

Risk or profit-sharing arrangements can vary from project to project, and should be worked out during the project's predevelopment phase and contract negotiations between the partners. The key point is that flexibility can expand the universe of acceptable deals because investors may be more willing to enter into an agreement when both sides have skin in the game. This type of risk sharing flexibility would seem to be particularly well suited for an enabling technology like broadband that can support a mix of applications and services across a diverse customer base.

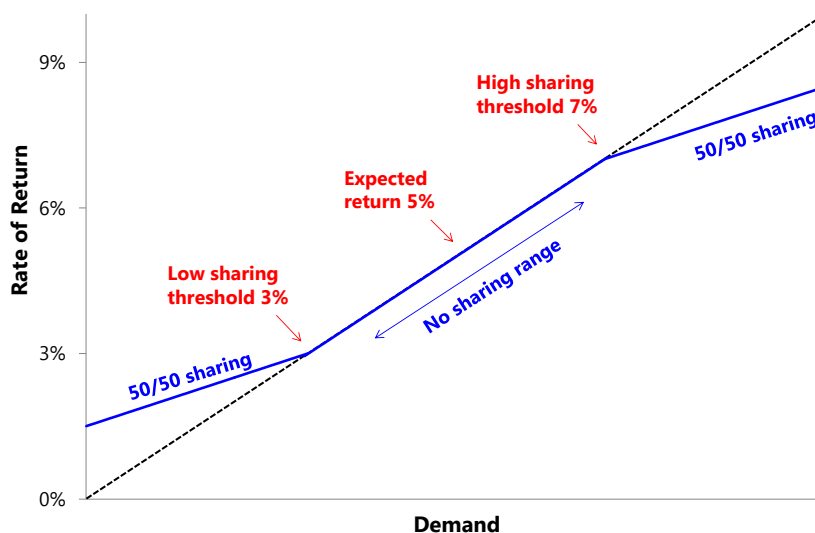


Figure 1: A stylized framework reflecting the main principles of Risk or profit-sharing arrangements

⁷⁴ U.S. Department of the Treasury. Office of Economic Policy. *Expanding the Market for Infrastructure Public-Private Partnerships*. Washington, 2015. Available at: <https://www.treasury.gov/connect/blog/Documents/Treasury%20Infrastructure%20White%20Paper%20042215.pdf>.

While specific contract terms and conditions will vary according to each transaction, the chart above illustrates a stylized framework that reflects the main principles of this approach.

Instead of a user fee model, consider a contract where the private partner retains all profits within the 3 to 7 percent rate of return range (“No sharing range”) but the government sponsor shares 50-50 in any return shortfall below 3 percent or any returns in excess of 7 percent. The solid blue lines represent the private sector return above and below the negotiated return thresholds of 3 and 7 percent, respectively. If demand falls into the low range, the private firm will absorb just half of the shortfall between the 3 percent threshold and the actual rate of return (on the dashed black line), experiencing the return illustrated by the solid blue line. To make up the shortfall, the public sponsor may pay a subsidy to the private partner analogous to an availability payment. If demand reaches the high range, the private firm will share half of the return above 7 percent with the project sponsor.⁷⁵

While the quantitative details of specific transactions may vary, the basic principle is the same; this approach can be implemented by incorporating key characteristics of the contract into the competitive bidding process widely used to award P3 contracts. For example, the public sponsor, possibly with the assistance of outside financial experts, could define the structure of the desired contract, and private firms vying for the project would bid on the specific contractual elements, such as their preferred sharing percentages or rate of return thresholds. The public sponsor would evaluate the bids, selecting the bidder most likely to deliver the project at the lowest lifecycle cost while meeting quality standards, maximizing value for taxpayers.⁷⁶

⁷⁵ *Id.* (Depending on the contract details, different metrics could be used on the “y-axis,” such as the dollar amount of profit or revenue.)

⁷⁶ *Id.*

CHAPTER VI: RECOMMENDATIONS AND CONCLUSIONS

Recommendations

The recommendations in this section are listed in the order in which they generally appear in the text. They are not ranked in any particular order and serve to reinforce not only the individual recommendations, but also the overarching recommendation that P3s are a powerful tool with many opportunities for application in the Arctic. Application of traditional and non-traditional P3 arrangements could serve as a significant source of funding for Arctic maritime transportation needs as well as community and economic development needs. As mentioned in the text, strict interpretations of financial and financing arrangements are not always appropriate, particularly for a region as unique as the Arctic. The following recommendations should be used to help guide the planning process for Federal departments and agencies as well as for communities and industries that are interested in exploring the possibilities P3 may offer for their infrastructure priorities.

1. Federal agencies should work closely with state, local, and tribal governments and the private sector, including Alaska native corporations, to ensure policies maximize overall investment in and adoption of services
2. Federal agencies should work together to create a policy environment conducive for developing holistic innovative financing guidelines that could be applied consistently across the Federal government.
3. Flexibility in determining the national economic benefits of development in Alaska, one of the barriers to any successful P3, may provide an avenue to pursue non-traditional financing and investment arrangements, previously unavailable in the region.
4. Explore whether land use rights and/or land ownership can be leveraged for infrastructure development (e.g. publicly owned land leased and used for private development) as part of a P3 arrangement.
5. There are a variety of potential options and ingenuity for financing, land acquisition, and economic justification that should be explored to the fullest extent possible to identify any collaborative opportunity where P3 or non-traditional financing could be applicable to development of port infrastructure.
6. A regional ship waste management strategy could include a regional reception facility plan which could take advantage of formal or informal agreements, including near-Arctic waters facilities. The benefits of such a strategy may include minimizing the risks associated with waste disposal facilities located in remote regions or only seasonally operational and sharing of waste management resources, infrastructure costs, and maintenance costs.

7. Explore potential financing partnerships that would be regionally based and, depending on the locations included in the agreements, include facilities that are available year-round as well as seasonally, thus minimizing risks and maximizing potential users.
8. Leverage existing programs and find ways to adapt them to the infrastructure needs of Arctic communities may provide a first step toward ensuring infrastructure exists to expand the maritime capabilities.
9. Combine the benefits of grant and finance programs to provide more flexibility for small communities to increase their infrastructure stability and energy security and grow their maritime economies.
10. Work to identify private partners and stakeholders who can provide the capital and the freight to submit for Marine Highway Project funding to cover infrastructure deficits.
11. Review Alaska airport locations that would be considered critical infrastructure nodes during an emergency response situation and explore the possibility of using the FAA Airport Privatization Pilot Program or similar to ensure that airport infrastructure is sufficient to support a large scale response.
12. Identify opportunities for research and development (RD) cooperative projects which could leverage both the needs of the Government and communities with the talents and funding of private industry. Identify opportunities where known technology gaps can be leveraged through investment partnerships that are then able to market the resulting products back to governments and the private sector potentially providing an opportunity for the return on the investment needed to get critical technology to market.
13. Utilize programs like Arctic Oil Spill Response Research (OSRR) to build the base for technology development, demonstration, and staging/deployment which could take the form of P3 or similar financing arrangements.
14. Support the use and expansion of predevelopment funds for cutting-edge projects to provide seed capital for regional collaboration models such as regional infrastructure exchanges and set up an Arctic-region infrastructure exchange.
15. Expand access to predevelopment funding for infrastructure projects, and identify opportunities for connecting state and local-based projects with complementary Federal predevelopment resources.
16. Explore non-traditional P3 structures such as subsidy payments, analogous to an availability payment, which includes specific service requirements and accountability that need to be maintained in order to receive the funding. This would include developing a methodology to compare the costs of firms applying for the subsidy payments to the average cost of “similarly situated” firms.
17. Identify and explore programs that are designed to encourage financial institutions to channel their resources to underserved, low income, or non-metropolitan communities in order to help improve the economic resilience and incomes of these communities. Under these programs, financial institutions would have increased incentives to lend to or invest in P3s that are involved with building or rehabilitating communications infrastructure.

18. Identify projects and partnerships where the construction, operations and maintenance, and financing costs of new or rehabilitated infrastructure and services in Arctic coastal communities could potentially be shared by direct payments from local residential/business customers, Federal subsidy-availability payments, as well as payments by maritime assets (vessels and oil rigs) that would benefit from having access to the asset.
19. Identify alternative P3 incentive structures that can potentially align public and private sector interests in infrastructure provision and management by having both partners share in the project's downside risk as well as the upside potential.

Conclusions

Infrastructure investment is vital for economic growth and prosperity in the Arctic, especially given the significant infrastructure gaps currently faced. Public-private partnerships represent a promising approach that can leverage the strengths of the private and public sectors to expand and improve Arctic infrastructure. In each case, the public authority must establish that a P3 would provide net benefits that go beyond what is attainable through conventional procurement. Successful P3 implementation requires executing a set of additional best practices before the project gets underway. Failing to follow due diligence methodology could lead to higher costs, failure to meet performance targets later in the life cycle, and a misallocation of public resources.

To that end, there are opportunities to use and adapt P3 to the U.S. Arctic. Through Federal agencies coordination with state, local and tribal governments and the private sector policies can be created to maximize overall investment in and adoption of services. These kinds of relationships and collaboration can also provide flexibility in determining the national economic benefits of development in Alaska which may provide an avenue to pursue non-traditional financing and investment arrangements. Working with private industry and investors to use existing guidelines like the Federal Resource Guide for Infrastructure Planning and Design may help and identify opportunities for connecting state and local-based projects with complementary Federal resources including predevelopment sources.

The Exploration of non-traditional P3 structures such as subsidy payments and aligning public and private sector interests in infrastructure provision and management and risk allocation can provide powerful tools and opportunities unavailable through traditional procurement arrangements.

At its heart, a P3 furnishes alternative financing mechanisms which can be leveraged through targeted collaborations to achieve successful delivery of critical Arctic infrastructure. P3 are a powerful financing mechanism and should be considered as a valuable option for delivering the infrastructure necessary to ensure safe, secure, and environmentally sustainable maritime transportation in the U.S. Arctic.