

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20

DRAFT

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

National Strategy for the Arctic Region Implementation Plan Task 1.1.3

October 21, 2016

Prepared By

The U.S. Committee on the Marine Transportation System
Arctic Marine Transportation Integrated Action Team

For the

U.S. Department of Transportation

21 **Contents**

22 INTRODUCTION 3

23 CHAPTER I: THE NATURE OF PUBLIC-PRIVATE PARTNERSHIPS..... 5

24 Definition 5

25 Contracts versus Partnerships 6

26 Types of Contracts 7

27 Types of P3s..... 7

28 Revenue models for P3s..... 10

29 Determining factors for P3 success..... 11

30 Best practices 13

31 CHAPTER II: AUTHORITIES FOR PUBLIC-PRIVATE PARTNERSHIPS 16

32 U.S. Federal Authority 16

33 State of Alaska Authorities 21

34 CHAPTER III: APPLICATION OF P3 TO U.S. ARCTIC INFRASTRUCTURE..... 23

35 Alaska Examples..... 25

36 CHAPTER IV: FUNDING THE DEVELOPMENT OF ENABLING INFRASTRUCTURE 27

37 INFORMATION INFRASTRUCTURE 27

38 PHYSICAL INFRASTRUCTURE..... 29

39 WATERWAYS MANAGEMENT 35

40 EMERGENCY RESPONSE..... 38

41 CHAPTER V: INNOVATIVE FINANCING TO MEET U.S. ARCTIC NEEDS 44

42 Predevelopment or Project Preparation..... 44

43 Non-traditional P3s 46

44 Risk Sharing..... 48

45 CHAPTER VI: RECOMMENDATIONS AND CONCLUSIONS 51

46 Recommendations..... 51

47 Conclusions..... 53

48 Annex I – Review of previous deliverables 54

49

50

INTRODUCTION

51
52

53 The U.S. Committee on the Marine Transportation System (CMTS) is a Federal Cabinet-level,
54 inter-departmental committee chaired by the Secretary of Transportation. The purpose of the
55 CMTS is policy coordinating committee composed of Federal departments and agencies with
56 responsibility for the Marine Transportation System (MTS). In 2010, the CMTS was directed by
57 statute to coordinate the establishment of domestic transportation policy to ensure safe and
58 secure maritime shipping in the Arctic. The January 2014 National Strategy for the Arctic
59 Region (NSAR) Implementation Plan (IP) directs the U.S. Department of Transportation to
60 execute three tasks under the objective *Prepare for Increased Activity in the Maritime Domain*.
61 These tasks were delegated to the CMTS by the Office of the Secretary of Transportation in May
62 2014.

63 The CMTS Arctic Marine Transportation Integrated Action Team completed its first deliverable
64 under NSAR *Prepare for Increased Activity in the Maritime Domain* with the delivery of a
65 report, “10-Year Projection of Maritime Activity in the U.S. Arctic”, to the White House
66 National Security Council in December of 2014 (Action 1.1.1).¹ The CMTS was also charged
67 with developing recommendations for infrastructure needs in the U.S. Arctic (Action 1.1.2). The
68 second report under Action 1.1.2 of the NSAR IP, “A Ten-Year Prioritization of Infrastructure
69 Needs in the U.S. Arctic,” provided a framework to coordinate the phased development of
70 Federal MTS infrastructure, and built on the 2013 CMTS Report to the President, *U.S. Arctic
71 Marine Transportation System: Overview and Priorities for Action*.²

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

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>.

81 Over the past decade, vessel activity has more than doubled in the U.S. Arctic. There is an
82 emergent need to better understand and characterize the infrastructure requirements and gaps,
83 and to identify solutions to address those gaps. The Arctic poses unique challenges based on
84 already difficult conditions, resource constraints, and changing climate conditions which may
85 make traditional mechanisms infeasible. The goal of this report is to provide information and
86 resources to inform decision making and provide innovative options to address the growing
87 infrastructure needs in the U.S. Arctic. When referring to infrastructure, this report not only
88 addresses opportunities for physical infrastructure, but also includes communications, planning,
89 management, and response infrastructure.

90 The report, henceforth referred to as the “Action 1.1.3 Report,” provides background on P3
91 definitions and Federal and State Government authorities. It also explores the current
92 applications of P3 to U.S. Arctic maritime infrastructure and provides examples of projects
93 currently underway that use P3 or alternative financing mechanisms. As required, Action 1.1.3
94 Report evaluates potential mechanisms to address the recommendations made in the report under
95 Action 1.1.2. The last section takes a closer look at innovative financing mechanisms that may
96 not fall under traditional P3 definitions as a means to provide hybrid approaches to financing
97 Arctic infrastructure. Finally, the Action 1.1.3 Report includes recommendations and conclusions
98 on the opportunities for using alternative financing methods to support infrastructure in the U.S.
99 Arctic.

100
101
102
103
104
105
106
107
108
109
110
111

112 **CHAPTER I: THE NATURE OF PUBLIC-PRIVATE PARTNERSHIPS**

113

114 **Definition**

115 *Public-Private Partnerships*

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

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

124

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

128

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

132

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

141

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.

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

147
 148 Bundling project elements transfers the responsibility, and therefore risks, for multiple project
 149 phases to a single private entity. This approach can lead to incentives to exploit synergies
 150 between project phases (e.g. making investment decisions in the construction phase that lower
 151 future Operation and Maintenance (O&M) costs). A P3 can also lower monitoring costs for the
 152 public sponsor as there are fewer contractual relationships compared to conventional
 153 procurement. In addition, P3s may provide stronger incentives for on-time delivery to start
 154 producing cash flows as soon as possible for debt and equity investors.

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

158

159 **Contracts versus Partnerships**

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

162

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 longer-term contractual relationships between a public agency and a private sector party to provide a public service and potentially generate revenue.

163

164 **Types of Contracts**

165
 166 Publicly-owned infrastructure assets are typically designed, constructed, operated, and
 167 maintained through “conventional procurement,” in which the sponsoring government entity
 168 owns the asset but separately contracts for each service, often from different private firms.
 169 Under conventional procurement, the government first contracts with a private entity to supply
 170 the infrastructure design, then seeks bids to build the asset according to that design, likely from a
 171 separate firm, and finally, operates and maintains the infrastructure asset itself, or takes bids
 172 from yet another firm to operate and/or maintain the asset on behalf of the government.

173
 174 A competitive bidding approach allows the public sector to have highly qualified private firms
 175 fulfill the requirements of various project phases; however, contracted parties do not have an
 176 incentive to minimize lifetime project costs, only those costs incurred during their respective
 177 phases.⁶ Conventional procurement may also lead to delays if public capital expenditures are
 178 dependent on the vagaries of the budget appropriations process. Moreover, funding uncertainties
 179 that impede government-provided maintenance may adversely affect long term asset and service
 180 quality.

181

182 **Types of P3s**

183 As with contracts, there are different types of P3 arrangements that have different sets of risks
 184 and benefits associated with them. Determining the best arrangement for the specific project is
 185 key to designing a successful partnership. This section will discuss five of the more prominent
 186 P3 arrangements and will also touch on what is not considered a P3 for the purposes of this
 187 report⁷.

188 1) Design Build (DB): A DB is when the private partner provides both design and construction
 189 of a project to the public agency. A simple Design-Build approach creates a single point of
 190 responsibility for design and construction and can speed project completion by facilitating
 191 the overlap of the design and construction phases of the project. This type of partnership can
 192 reduce time, save money, provide stronger guarantees, and allocate additional project risk to
 193 the private sector. It also reduces conflict by having a single entity responsible to the public
 194 owner for project design and construction. The public sector partner owns the assets and has
 195 the responsibility for the operation and maintenance. Even this small adjustment to the

⁶ 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.

⁷ 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.)

196 arrangement has a benefit over conventional procurement. By bundling the responsibility for
 197 design and construction, the private firm has an incentive to create the highest quality design
 198 to minimize design problems and construction issues that could lead to cost overruns.

199 2) Design-Build-Maintain (DBM): A DBM is similar to a DB except the maintenance of the
 200 facility for some period of time becomes the responsibility of the private sector partner. The
 201 benefits are similar to the DB, with maintenance risk being allocated to the private sector
 202 partner and the guarantee expanded to include maintenance. The public sector partner owns
 203 and operates the assets.

204 3) Design-Build-Operate (DBO): A single contract is awarded for the design, construction, and
 205 operation of a capital asset. Title to the facility remains with the public sector unless the
 206 project is a Design/Build/Operate/Transfer or Design/Build/Own/Operate project. The DBO
 207 method of contracting is different from the conventional, or traditionally separated and
 208 sequential approach ordinarily used in the United States by both the public and private
 209 sectors. The traditional method involves one contract for design with an architect or
 210 engineer, followed by a different contract with a builder for project construction, followed by
 211 the owner's taking over the project and operating it. A simple Design-Build approach creates
 212 a single point of responsibility for design and construction. On a public project, the
 213 operations phase is normally handled by the public sector under a separate operations and
 214 maintenance agreement. Combining all three phases into a DBO approach maintains the
 215 continuity of private sector involvement and can facilitate private-sector financing of public
 216 projects supported by user fees generated during the operations phase.

217 4) Design-Build-Operate-Maintain (DBOM): The Design-Build-Operate-Maintain (DBOM)
 218 model is an integrated partnership that combines the design and construction responsibilities
 219 of design-build procurements with operations and maintenance. These project components
 220 are procured from the private sector in a single contract, with financing secured by the public
 221 sector. The public agency maintains ownership

222 5) Design-Build-Finance-Operate-Maintain (DBFOM): With the Design-Build-Finance-
 223 Operate-Maintain (DBFOM) approach, the responsibilities for designing, building, financing,
 224 operating, and maintaining are bundled together and transferred to private sector partners.
 225 There is a great deal of variety in DBFOM arrangements in the United States, especially the
 226 degree to which financial responsibilities are actually transferred to the private sector. One
 227 commonality that cuts across all DBFOM projects is that they are either partly or wholly
 228 financed by debt leveraging revenue streams dedicated to the project. Direct user fees (e.g.,
 229 tolls) traditionally have been the most common revenue source. However, the availability
 230 payment model has been adopted in an increasing percentage of U.S. P3s, and some projects
 231 have incorporated revenue sharing arrangements as a way to lessen risk. Future revenues are
 232 leveraged to issue bonds or other debt that provide funds for capital and project development
 233 costs. They are also often supplemented by public sector grants or loans in the form of

234 money or contributions in kind, such as rights-of-way.⁸ In certain cases, private partners may
235 be required to make equity investments as well. Value for Money (VfM) for taxpayers can
236 be attained through life-cycle cost optimization, achieved by bundling the responsibility for
237 multiple project phases with a single private partner.⁹

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

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

246 The following are examples of arrangements not considered P3s:

- 247 ○ **Privatization**- transferring an enterprise or industry from the public sector to the
248 private sector.
- 249 ○ **Joint ventures with the private sector** - a commercial enterprise undertaken
250 jointly by two or more parties that otherwise retain their distinct identities.
- 251 ○ **Co-ownership with another public sector body** - sharing ownership in an asset
252 with another individual or group
- 253 ○ **Arrangements for the divestiture of Federal assets**- where the private partner
254 will become the new owner
- 255 ○ **Service only arrangements** – where a business is going to provide services to the
256 public sector

258

259

260

261

⁸ 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>.

⁹ 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.”)

262 Revenue models for P3s

263 As noted previously, P3s often have a revenue component which sets it apart from simple
 264 contracting agreements. By using revenue based arrangements, alternative mechanisms for
 265 financing the investment are created. Arguably, uncertainty in demand is the most important
 266 source of uncertainty affecting an infrastructure project's financial viability, particularly in the
 267 case of new build, or "greenfield" projects in which the private partner's compensation is
 268 determined by user volume, but for which no history of use exists. P3s have typically used the
 269 basic user fee or availability payments models to allocate all demand risk and revenue risk to
 270 either the private partner or the government, limiting the number of mutually acceptable P3 deals
 271 for investors and project sponsors.¹⁰

272
 273 User fees are collected directly from consumers of an infrastructure service, such as highways,
 274 bridge tolls, and water service bills. The amount of revenue received by the private partner
 275 varies directly with the level of utilization of the infrastructure asset – fewer than expected cars
 276 on a toll road means less revenue. As a result, in a "basic" user fee model, the private partner
 277 bears all of the demand risk if the project under performs, and also stands to gain and possibly
 278 make excess profits if utilization of the infrastructure rises far above expectations.¹¹

279
 280 Availability payments are periodic payments made by the government to the private partner as
 281 long as the service meets contracted quality standards. Unlike user fees, availability payments
 282 are fixed recurring payments that do not vary with usage of the infrastructure asset and may be
 283 employed when user fees are not appropriate (e.g. P3 contracts for maintenance of social
 284 infrastructure, such as schools or hospitals). Ultimately, the public sponsor must finance
 285 availability payments with taxes, user fees that it collects directly from users of the infrastructure
 286 asset, or a combination; if these financing sources are insufficient the public sponsor is still
 287 obligated to make fixed availability payments to the P3 as long as performance standards are
 288 met. Even projects for which user fees are feasible, availability payments are popular with some
 289 private sector partners because they eliminate the private firm's exposure to demand-driven
 290 revenue volatility. Under an availability payments model, the government bears all of the
 291 demand risk if the project under performs, and does not realize any benefit if demand exceeds
 292 expectations.¹²

293

¹⁰ 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>.

¹¹ 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.

¹² *Id.*

294 New and alternative P3 incentive structures can potentially align public and private sector
 295 interests in infrastructure provision and management, in contrast to the basic user fee and
 296 availability payments models that allocate all demand risk (and therefore, revenue risk) to either
 297 the private sector partner or the government. For example, incentive structures used in private
 298 industries that are regulated to protect the public interest — electric power, gas and oil pipelines,
 299 and telecoms — can be applied to P3s. These industries have attracted substantial private
 300 investment flows while providing for demand risk to be shared between the government and the
 301 private sector.¹³

302

303 **Determining factors for P3 success**

304 Public-private partnerships have the potential to deliver higher quality and lower cost projects
 305 than traditional procurement, but not all projects are suitable candidates. It is important to
 306 evaluate fundamental characteristics of each project to determine whether a P3 is the best
 307 approach. An essential requirement for a P3 is that the potential exists for bundling the
 308 responsibility for multiple project phases with a single private entity. As discussed previously,
 309 bundling can lead to incentives to exploit synergies between project phases, and can therefore
 310 achieve lower life-cycle costs than under conventional procurement. Assuming a project meets
 311 this basic requirement, other important considerations include:¹⁴

- 312 • Investment size
- 313 • Understanding future costs
- 314 • Leveraging specialized skills
- 315 • Potential for innovation
- 316 • Setting standards
- 317 • Revenue generation

318

319 Generally, larger investments lend themselves to the potential for successful partnerships.
 320 Projects need to be sufficiently large to offset a P3's higher financing and transactions costs with
 321 substantial life-cycle cost savings. An additional benefit of larger projects is that they attract
 322 large institutional investors, such as pension funds, that perform important due diligence
 323 functions.¹⁵ This can help increase the odds that the project is P3-suitable. Longer contract

¹³ 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>

¹⁴ 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

¹⁵ *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.)

324 duration can also help tilt the balance in favor of a P3 by allowing the private partner to rely on a
325 long-term, reasonably secure revenue source to recover its investment and earn a competitive
326 return.

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

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

346 One benefit of seeking private partners is the ability to leverage their specialized skills and
347 expertise. If the private sector can demonstrate an advantage over the public sector in complex
348 projects that combine a mix of required skill sets over the project’s life-cycle, then a P3 may
349 deliver an infrastructure asset with higher quality or lower costs. Depending on the specifics of
350 the project, private-sector expertise may be more likely, especially if projects of a similar size
351 and scope have been previously executed. Additionally, if there are multiple potential private
352 partners with expertise, then competition in bidding and greater costs savings for the public
353 sector may result.

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

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

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

376

377 **Best practices**

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

381 There are several areas where proactive planning can help maximize the net social benefits of P3
382 procurement and the project's success. Considerations include fostering environments conducive
383 to P3s, pursuing rigorous project preparation, critically assessing the feasibility of the project,
384 and structuring the risk so it is balanced across P3 contract parties.

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

393 Managing a rigorous project preparation process is also a key to success. In preparation for
394 potential partnerships, setting up core frameworks such as project management offices, an
395 interdisciplinary expert team and determining a standardized process for preparation of P3
396 proposals are all key elements. These efforts will help to create a transparent governance
397 structure as well as facilitate the process and funding for completing feasibility studies, a

398 necessary step in determining if P3 is the right direction for the project. By engaging in critical
399 planning, monitoring functions, and the development of output metrics to track performance, the
400 underlying requirements for performance-based contracts are created, a necessary element for
401 cost-effective and high-quality P3s.

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

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

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

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

- 430 1) Build resilient societies through economic development;
- 431 2) Respect and include local communities and indigenous people;
- 432 3) Pursue measures to protect the environment of the Arctic;
- 433 4) Practice responsible and transparent business practices;
- 434 5) Consult and integrate science and traditional ecological knowledge; and

435 6) Strengthen pan-Arctic collaboration and sharing of best practices.

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

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

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

450 Among other goals, the AEC highlights an understanding of the need for infrastructure
451 investments and the costs associated with enabling infrastructure that would make business
452 undertakings more economical and feasible. The organization acknowledges that P3s enable
453 stakeholders from government, industry, and other organizations to come together to identify the
454 most viable and broad based economic solutions. The AEC works to ensure that P3 is
455 considered where applicable, to promote best regulatory practices, and, to the extent possible,
456 seek to align rules and regulations to ease the flow of business.

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

460

461

462

463

464

465

466 **CHAPTER II: AUTHORITIES FOR PUBLIC-PRIVATE PARTNERSHIPS**

467

468 **U.S. Federal Authority**

469

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

472 The 2014 Water Resources Reform and Development Act (WRRDA) was enacted as a catalyst
473 for the establishment of P3s in the transportation sector.¹⁶ The primary goal of WRRDA is the
474 encouragement of private sector participation in water resources projects that are beneficial to
475 the general public.¹⁷ One of the provisions of WRRDA required the establishment of the Water
476 Infrastructure Public Private Partnership Program (WIPPP). WIPPP facilitates the
477 “establishment of innovative financing mechanism to carry out and manage the design and
478 construction of [Army] Corps projects by involving the private sector.”¹⁸ Furthermore, the
479 WRRDA created a Water Infrastructure Finance Innovations Authority (WIFIA) “to provide
480 credit assistance for drinking water, waste water, and water resources infrastructure projects.
481 This project employs the model of the Transportation Infrastructure Finance and Innovation Act
482 (TIFIA) program for surface transportation.¹⁹ WIFIA is a five-year program that “leverages
483 Federal funds by attracting substantial private or other non-Federal investments to promote
484 infrastructure development.”²⁰

485

486 The Transportation Infrastructure Finance and Innovation Act (TIFIA) provides long-term,
487 flexible financing to highway and transit projects that feature dedicated revenue sources. Each
488 dollar of Federal TIFIA funding can support about \$10 in loans, loan guarantees, or lines of
489 credit.²¹ TIFIA plays a significant role in financing large scale surface transportation projects,
490 including highways, public transit, passenger and freight railroads, intermodal freight, and port
491 access. The Fixing America’s Surface Transportation Act (FAST) expands eligibility to include

¹⁶ 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>.

¹⁷ 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.

¹⁸ *Id.* at 7.

¹⁹ *Id.*

²⁰ *Id.*

²¹ 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.)

492 transit-oriented development and the capitalization of a rural projects fund within a state
 493 infrastructure bank.^{22, 23} The program focuses on attracting substantial private and other non-
 494 Federal co-investment by providing supplemental and subordinate capital, and plays a
 495 significant role in transport P3 investment. In many cases, the lower cost of capital and flexible
 496 terms offered by TIFIA are critical factors in determining whether a P3 is a viable and cost-
 497 effective option for a project.

498

499 In the context of P3s, research and development projects can be conducted in the form of
 500 Cooperative Research and Development Agreements (CRADA).²⁴ CRADAs are a result of the
 501 Stevenson-Wydler Technology Innovation Act of 1980 and were amended by the Federal
 502 Technology Transfer Act of 1986.²⁵ This government-wide authority “allows the Federal
 503 Government, through its laboratories, to provide personnel, services, facilities, equipment,
 504 intellectual property or other resources with or without reimbursement to non-Federal parties and
 505 the non-Federal parties to provide similar resources toward the conduct of specific research or
 506 development efforts consistent with the mission of the labs.”²⁶ The individual department
 507 “publishes approved documents and potential available markets” that are utilized by the private
 508 sector to facilitate the development of solutions for the department.²⁷ These initial partnerships
 509 are formalized through CRADAs that “describe in the detail the relationship, roles and
 510 responsibilities and deliverables for each party.”²⁸ The implementation of CRADAs results in a
 511 competitive bidding process and cooperative relationships between the public entity and the
 512 private sector.

²² 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/.

²³ 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

²⁴ 15 U.S.C. § 3710(a)

²⁵ 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>.

²⁶ Technology Transfer Mission (48 CFR § 970.5204-40). Available at: https://books.google.com/books?id=nq88AAAAIAAJ&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=0ahUKEwi1hKayyNXPAhUBVh4KHbsRAKgQ6AEIPDAF#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.

²⁷ 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.

²⁸ *Id.*

513 In recent years, the White House has initiated two efforts that directly and indirectly impact the
 514 application of P3s in government infrastructure-related activities. In 2013, the Office of
 515 Management and Budget (OMB) published a Super Circular (78590) to “deliver on the promise
 516 of a 21st-Century government that is more efficient, effective, and transparent.” The Super
 517 Circular focuses on reforming Federal administrative requirements, cost principles, and audit
 518 requirements for Federal awards.²⁹ These reforms aim to strengthen internal compliance
 519 requirements and accountability while also providing administrative flexibility for non-Federal
 520 entities. OMB developed the Super Circular in response to “directives from President Obama
 521 regarding reducing unnecessary regulatory and administrative burdens, redirecting resources to
 522 services that are essential to achieving better outcomes at lower cost, and strengthening
 523 accountability by intensifying efforts to eliminate payment error, waste, fraud and abuse”.³⁰ In
 524 essence, the Super Circular is intended to streamline administrative guidance for major policy
 525 reforms for P3.

526 On July 17, 2014, the President released a memorandum launching the Build America
 527 Investment Initiative, directing Federal agencies to expand public-private collaboration on
 528 infrastructure development and financing.³¹ A significant result of the directive is the
 529 Department of Transportation’s Build America Transportation Investment Center (BATIC), now
 530 the Build America Bureau (the “Bureau”).³² The Bureau helps to connect government agencies
 531 and private industries and assist companies across the country to navigate the process involved in
 532 designing, financing, building, and permitting large-scale surface transportation improvement
 533 projects.³³ The goal is for the Bureau to be a one-stop shop for state and local governments,
 534 public and private developers, and investors seeking to utilize innovative financing strategies for
 535 surface transportation infrastructure projects.³⁴ Separately, under the Maritime Administration’s
 536 Strong Ports program, the Department of Transportation, in collaboration with the American
 537 Association of Port Authorities, developed a Port Planning and Investment “Toolkit” to assist
 538 port authorities pursuing modernization projects, including those interested in P3.

²⁹ 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>.

³⁰ Eleanor A. Evans. *Navigating the OMB Super Circular Changes*. CAPLAWupdate (2014). Available at: http://www.caplaw.org/resources/PublicationDocuments/updatenewsletter/2014/CAPLAW_NavigatingtheOMBSuperCircularChanges_SpecialEdition2014.pdf.

³¹ 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>.

³² Brigham A. McCown, *Will Public Private Partnerships Build the Future?* Forbes, 8/27/2014. Available at: <http://www.forbes.com/sites/brighammccown/2014/08/27/building-partnerships-for-the-future/>.

³³ *Id.*

³⁴ The Fixing America’s Surface Transportation Act (FAST Act) signed by the President last December effectively institutionalizes BATIC’s key functions at DOT.

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

542

543

544

545

546

547

548

549

550

551

552

553

554

555

556

557

558

559

560

561

562

563

564

565 **Table of Federal Agency Statutory Authorities:** The following table is a summary of some of the
 566 statutory authorities given to Federal agencies.
 567

MARITIME ADMINISTRATION	46 U.S.C. § 50101	Allows for the Administration to enter into public-private partnerships
	46 U.S.C. § 50307 is more specific in authorizing the Secretary of Transportation	[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
DEPARTMENT OF ENERGY	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 INTERIOR	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 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.

568 **State of Alaska Authorities**

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

State of Alaska Authority	17 AAC 95.040 is the implementing statute 17 AAC 95.020, 17 AAC 95.030 are the provisions in which a public-private partnership can be awarded	The authority can enter in P3s for a variety of services, which include services for engineering, design, maintenance, etc. Proposers selected from a shortlist of proposers are eligible for an award for a P3 agreement
Alaska Industrial Development and Export Authority (AIDEA)	AS 44.88.010-120 is the implementing statute for the AIDEA 44.88.010 (10(A) encourages private investment	The Legislature created AIDEA to provide financing for Alaskan businesses to expand the economy of the state and provide jobs for Alaska. AIDEA also works with private partners to invest, lend, and import capital. The private partners include people, banks and other financial institutions.
Alaska Energy Authority (AEA)	AS 44.83 is the enabling legislation for the Alaska Energy Authority	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.
Power Cost Equalization (PCE) Program	Alaska Statutes 42.45.100-170	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. The Alaska Energy Authority (AEA) determines eligibility of community facilities and residential customers and authorizes reimbursement to the electric utility for the PCE credits extended to customers.

572

573

574 The Alaska Industrial Development and Export Authority (AIDEA) is a public corporation of the
575 State of Alaska, created in 1967 by the Alaska Legislature.³⁵

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

580 Specifically, Alaska Statute § 44.88.088 (Statute) creates strong financial incentives for private
581 sector construction of ports, roads, and other critical projects in Alaska's Arctic region. Alaska
582 Stat. § 44.88.088 (2014). In conjunction with AIDEA, the funds establish a program where
583 borrowers must be found to meet "sufficient job creation, rural development, Arctic
584 infrastructure development, or other economic development criteria." Alaska Stat. §
585 44.88.159(g). By providing access to the State's revolving fund through payment of a reasonable
586 dividend rate, the Statute offers stable government funding with limited requirements and
587 restrictions on the amount and duration of the loan, pursuant to Alaska Stat. § 44.88.840.
588 Overall, the goal of the Statute is to promote the "construction, improvement, rehabilitation, or
589 expansion of a facility" either in the Arctic to aid in regional development or meet emergency
590 response needs, in the state if such furthers development in the Arctic, or in relation to shore-
591 based facilities that service fisheries in the Arctic. Alaska Stat. § 44.88.900.

592 The Alaska Energy Authority (AEA) is an independent corporation governed by a board of
593 directors with the mission to "reduce the cost of energy in Alaska." AEA is the state's energy
594 office and lead agency for statewide energy policy and program development (more information
595 on the AEA is provided in the below).³⁶

596 AEA also manages the Renewable Energy Fund³⁷, the Emerging Energy Technology Fund³⁸, the
597 Power Cost Equalization Program, Power Project Loan Fund³⁹, and various Energy Efficiency
598 and Conservation Programs.⁴⁰ AEA provides grants and loans for qualified energy infrastructure
599 projects and also owns energy infrastructure for the benefit of Alaskans.

³⁵ State of Alaska. Alaska Industrial Development and Export Authority. Available at:
<http://www.aidea.org/AIDEAHome.aspx>.

³⁶ State of Alaska. Alaska Energy Authority. Available at: <http://www.akenergyauthority.org/>.

³⁷ 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/REFAEPrinterspreads8515II.pdf>.

³⁸ State of Alaska. Alaska Energy Authority. Emerging Energy Technology Fund. Available at:
<http://www.akenergyauthority.org/Programs/EETF>.

³⁹ State of Alaska. Alaska Energy Authority. Loan Programs: Power Project Loan Fund. Available at:
<http://www.akenergyauthority.org/Programs/Loans>

⁴⁰ State of Alaska. Alaska Energy Authority. Power Cost Equalization. Available at:
<http://www.akenergyauthority.org/Programs/PCE>.

600 **CHAPTER III: APPLICATION OF P3 TO U.S. ARCTIC**
601 **INFRASTRUCTURE**
602

603 The development of P3s in the U.S. Arctic could provide the necessary investment flexibility to
604 enable construction of vital MTS-related infrastructure in the region. MTS-related infrastructure
605 includes the traditional definition of physical infrastructure, but also includes communication,
606 planning, management, and response infrastructure.

607 In addition to providing enabling legislation for P3s, WRRDA (Sec. 2105) on Arctic deep-draft
608 port development partnerships states that the Secretary of the Army may provide technical
609 assistance to non-Federal public entities, including Indian tribes... for the development,
610 construction, operation, and maintenance of channels, harbors, and related infrastructure
611 associated with deep-draft ports for purposes of dealing with Arctic development and security
612 needs; further...The Secretary of the Army is authorized to accept and expend funds provided by
613 non-Federal public entities, including Indian tribes... to carry out the technical assistance
614 activities described in subsection (a).⁴¹

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

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

627 The U.S. Army Corps of Engineers, for example, may have the authority to dredge a public
628 channel leading into the port, and may provide funding for building a publically owned pier, but
629 they are not responsible for, nor would they have the authority to, construct a private terminal or
630 dredge a private channel or turning basin. The construction and maintenance of privately owned
631 terminals, docks, and piers falls to another party in the arrangement.

⁴¹ 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>.

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

635 *Seagirt Marine Terminal*

636 The Maryland Port Administration (MPA) and Ports America Chesapeake, LLC (PAC) currently
 637 operate a P3 at the Port of Baltimore. In January 2010, the MPA and Ports America began a 50-
 638 year public-private partnership lease and concession agreement for Seagirt Marine Terminal.
 639 PAC runs the daily operations at Seagirt. The MPA receives an annual payment and ongoing
 640 revenues from Ports America during the life of the agreement. Ports America receives a base
 641 payment for 50 years and all net revenues from Seagirt business.⁴² Throughout this 50-year
 642 partnership, PAC must provide “\$378 million fixed annual payments and \$600 million in
 643 variable payments to MPA.”⁴³ In conjunction with the Port of Baltimore, the Maryland
 644 Transportation Authority received a payment of \$140 million to improve neighboring highways
 645 and bridges.⁴⁴

646

647 *Port of Miami Tunnel*

648 The Port of Miami Tunnel (PMOT) is a “public-private partnership designed to transfer the
 649 responsibility to design-build-finance-operate-and-maintain (DBFOM) the project to the private
 650 sector.”⁴⁵ Under the agreement, the Florida Department of Transportation (FDOT) makes
 651 payments to the operator during the construction of the tunnel when contractually determined
 652 milestones are achieved. When construction is completed, FDOT will make payments to the
 653 concessionaire that are contingent upon “actual lane availability and service quality.”⁴⁶ The state
 654 of Florida has contracted to cover 50% of the \$668.5 million project. The payments from the
 655 state of Florida are meant to cover capital costs, operations, and maintenance. The PMOT will
 656 be returned to FDOT in “first-class condition at the end of the contract in October 2044.”⁴⁷

657

658 *Fargo-Moorhead Diversion Project*

659 The Fargo-Moorhead diversion project is a U.S. Army Corps of Engineers (USACE)
 660 demonstration project for alternative financing and delivery in North Dakota and Minnesota.

⁴² Seagirt Marine Terminal Maryland Port Administration-Ports America Chesapeake Public-Private Partnership
 Available at http://www.mpa.maryland.gov/_media/client/smt15.pdf

⁴³ State of Maryland, Ports America Chesapeake, *Seagirt Marine Terminal*. Available at:
<https://www.pachesapeake.com/Seagirt/>.

⁴⁴ *Id.*

⁴⁵ Florida Department of Transportation. Port of Miami Tunnel. *Project Overview*. Available at:
<http://www.portofmiamitunnel.com/project-overview/project-overview-1/>.

⁴⁶ *Id.*

⁴⁷ *Id.*

661 Utilization of this delivery mechanism is anticipated to accelerate project delivery, reduce costs,
662 and minimize risk to both the public and government. The project will be delivered in two parts,
663 with the local sponsors leading a P3 that will complete a 30 mile diversion channel and
664 associated infrastructure and with the Federal Government leading the construction of a southern
665 embankment. This innovative approach will allow each of the project pieces to be delivered in
666 parallel.⁴⁸

667

668 **Alaska Examples**

669 *Delong Mountain Transportation System (DMTS)*

670 The Alaska Industrial Development and Export Authority (AIDEA) is a public corporation of the
671 State of Alaska, created in 1967 by the Alaska Legislature.⁴⁹ One of AIDEA's original projects is
672 the Delong Mountain Transportation System (DMTS). The DMTS is a 52-mile long, 30-foot
673 wide industrial haul road and a shallow-draft port with upland support facilities. The system
674 opened in 1989 to support the development of the Red Dog Mine in northwest Alaska. The Red
675 Dog Mine is operated by Teck Alaska, Inc. in conjunction with the local native corporation
676 (NANA Regional Corporation, Inc.) and is one of the largest producing zinc mines globally. The
677 DMTS provides the necessary infrastructure for the transport of the ore from the mine site to the
678 ore export barges.

679 Construction of the DMTS facilities was funded through an initial \$180 million in AIDEA cash
680 and bonding; the 1999 expansion involved approximately \$87 million of additional bonding.
681 Repayment of these bonds is achieved through a "toll" structure for use of the system by mine
682 company customers. The toll mechanism provides for a minimum annual payment and
683 additional payments based on escalated zinc prices and higher throughputs. The additional
684 throughput payments are deposited to a reserve account that is used for any potential unpaid
685 operation costs or future capital improvements. Excess reserve account balances are then
686 periodically distributed to AIDEA, Teck, and for expedited retirement of AIDEA's investment in
687 the project.⁵⁰

⁴⁸ U.S. Army Corps of Engineers. *Fargo-Moorhead diversion channel project receives Federal authorization*. 6/10/2014. Available at: http://www.mvp.usace.arm_y.mil/Media/News-Releases/Article/488768/fargo-moorhead-diversion-channel-project-receives-Federal-authorization/.

⁴⁹ State of Alaska. Alaska Industrial Development and Export Authority. Available at: <http://www.aidea.org/AIDEAHome.aspx>.

⁵⁰ 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.

688 *Ketchikan Shipyard*

689 The Ketchikan Shipyard is located in Ketchikan, Alaska, adjacent to the Alaska Marine Highway
690 System (AMHS) ferry facility. The shipyard consists of approximately 25.27 acres of real
691 property including various building, fixtures, a 10,000 long ton floating dry dock, various
692 equipment and tools, and other personal property. In 1997, the shipyard was transferred to
693 AIDEA. In conjunction with the transfer, an MOU between AIDEA, the City of Ketchikan,
694 Ketchikan Public Utilities and the Ketchikan Gateway Borough was created.

695 AIDEA has made capital investments in the shipyard, including the cost of acquiring the
696 shipyard (\$80.3 million) and a partial match to a 1999 Federal TEA-21 grant. AIDEA has also
697 matched Borough contributions to the repair and replacement (R&R) fund. AIDEA's financial
698 returns are through revenue and net profit sharing via payments to AIDEA, first to reimburse
699 AIDEA's administrative expenses (up to \$18,000), next into the R&R fund until its funded to
700 125 percent, and then distributed as profit sharing to the AIDEA, Borough and City of
701 Ketchikan.⁵¹

702 *Bradley Lake Hydroelectric Project*

703 Alaska Energy Authority (AEA) is an independent corporation of the state of Alaska and the
704 state's energy office. Their programs place Alaska at the forefront of innovative ways to address
705 high energy costs. The Bradley Lake Hydroelectric Project is one of several AEA projects and is
706 located 27-air miles northeast of Homer on the Kenai Peninsula. The Project has 120 megawatts
707 of installed capacity, providing five to ten percent of the annual Railbelt electric power.⁵² The
708 project consists of a 125-foot high concrete-faced, a rock-filled dam structure, three diversion
709 structures, a 3.5-mile long power tunnel and vertical shaft, a generating plant, an interior
710 substation, 20 miles of transmission line, and substation. Due to its remote location, the project
711 has its own airstrip, boat dock, residential quarters, and utility system.

712 The Alaska Energy Authority assumed responsibility for the project in 1982. In 1987, AEA and
713 the Railbelt utilities entered into a Power Sales Agreement. The Project has been online since
714 Sept. 1, 1991. Total project costs, including major capital improvements, as of June 30, 2015 are
715 \$328 million. The project was funded through legislative appropriations and AEA revenue
716 bonds that are being repaid by the participating utilities. The Bradley Project Management
717 Committee (BPMC) was formed in 1988 with representatives from each of the power purchasers
718 and AEA and generally manages the project.

719

⁵¹ 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.

⁵² *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.)

720 **CHAPTER IV: FUNDING THE DEVELOPMENT OF ENABLING**
721 **INFRASTRUCTURE**
722

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

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

738
739 **INFORMATION INFRASTRUCTURE**

740 **Communications**

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

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

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

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

761 More recently, in July 2015, the President and the Department of Housing and Urban
762 Development (HUD) announced the ConnectHome demonstration project. This new initiative
763 works with communities, the private sector, and Federal Government to expand high speed
764 broadband to more families across the country. The pilot program is launching in twenty-seven
765 cities and one tribal nation and will initially reach over 275,000 low-income households – and
766 nearly 200,000 children – with the support they need to access the Internet at home. The public-
767 private partnership with Internet Service Providers, non-profits, and the private sector will offer
768 broadband access, technical training, digital literacy programs and devices for low-income
769 residents in assisted housing units.⁵³

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

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

779 The August 2015 report of the Broadband Opportunity Council, co-chaired by the Departments
780 of Commerce and Agriculture, includes recommendations to encourage P3s. The report
781 acknowledges that the deployment of broadband requires collaboration between the public and
782 the private sector. It also recommends that as Federal agencies shape their broadband policies,
783 they should work closely with State, Local and Tribal governments and the private sector to
784 ensure those policies maximize overall investment in and adoption of broadband services.⁵⁴

⁵³ 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>.

⁵⁴ 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.

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

788

789 **PHYSICAL INFRASTRUCTURE**

790 **Port Access**

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

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

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

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

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

813

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

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

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

837
838 Although this project is considered a demonstration project, the financial mechanism and
839 structures leveraged to finance different components of the project are not unique to this project.
840 As the project progresses, it may be a valuable source for best practices that could inform the
841 planning efforts of other cities, states, and regions looking to leverage innovative finance
842 approaches. USACE is also pursuing a handful of other alternative financing projects that are
843 currently in various stages, including a project on the Illinois Waterway exploring the use of
844 alternative financing for O&M.

845
846 The USACE has additional authority under Section 2104 of the Water Resources Reform and
847 Development Act (WRRDA) of 2014 (P.L. 113-121) which expands USACE authority under the
848 existing Remote and Subsistence Harbor provision in the 2007 Water Resources Development
849 Act (33 U.S.C. 2242) with the intent to facilitate the ability of USACE to support projects that
850 fall outside the traditional national economic framework. Section 2006 provides that in
851 conducting a study of remote and subsistence harbor and navigation improvements, the Secretary
852 of the Army may recommend a project without need to demonstrate that the project is justified
853 solely by national economic development benefits if certain criteria are met. These criteria
854 include: that the community to be served is at least 70 miles from the nearest surface accessible
855 commercial point and has no direct rail or highway link served by those infrastructure assets, or
856 that the improvements are located in Alaska, among other states; that the harbor is economically
857 critical such that over 80 percent of the goods would be consumed within the region; and that the
858 viability of the community would be threatened without the improvement. Recommendations
859 for a project meeting the above criteria should also consider the public health benefits, access to

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

862
863 Although WRRDA does not grant explicit P3 capabilities or financial support, the flexibility in
864 determining the national economic benefits of development in Alaska, one of the barriers to any
865 successful P3, may provide an avenue to pursue non-traditional financing and investment
866 arrangements, previously unavailable in the region.

867
868 Additional opportunities for partnerships can include in-kind matches for financial investment by
869 other sectors. For example, it may be possible to explore whether land use rights and/or land
870 ownership can be leveraged for infrastructure development (e.g. publicly owned land leased and
871 used for private development).

872 The U.S. Maritime Administration (MARAD) has a Port Conveyance Program applicable to
873 agencies and departments of the Federal Government that own property that is no longer required
874 due to programmatic changes, relocation of resources, or other operational changes. The Federal
875 Property and Administrative Services Act of 1949, as amended, provides for the disposal of
876 excess real property to other executive agencies that have a need for the property, or, if there is
877 no such need, for disposal as surplus property.⁵⁵ This program has already been used in Alaska
878 by the City of Dillingham to support the expansion of their Small Boat Basin. In 2003, MARAD
879 conveyed 2.38 acres that were formerly operated by the Department of the Army to the City of
880 Dillingham.

881 There are other mechanisms for acquiring port property. Congress passed legislation on February
882 1, 2016 which included language that authorized the transfer of Port Clarence to the Bering
883 Straits Native Corporation (BSNC), the State of Alaska, and the retention of property by the U.S.
884 Coast Guard. President Obama signed the legislation into law on February 8. One goal of the
885 law is to facilitate infrastructure development and potential uses of Point Spencer, adjacent to
886 Port Clarence, Alaska. Subtitle C of Title V of the 2015 Coast Guard Reauthorization Act
887 specifically conveys portions of the 2,400 acre tract at Point Spencer to BSNC and the State of
888 Alaska.⁵⁶

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

⁵⁵ MARAD Port Conveyance (46 CFR § 387.2.). Available at: https://www.marad.dot.gov/wp-content/uploads/pdf/PCP_--_46_CFR_387.pdf.

⁵⁶ Coast Guard Authorization Act of 2015. Available at: <https://www.congress.gov/bill/114th-congress/house-bill/1987>.

894

895 **Arctic Port Reception Facilities**

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

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

906
 907 One challenge to implementing these regulations is the lack of infrastructure available in some
 908 areas of the Arctic to meet the needs of commercial vessels to offload waste. The creation of a
 909 regional arrangement (RA) is one approach that may allow Arctic countries and Arctic ports
 910 servicing ships calling at ports, or departing for/returning from Arctic regions, to provide
 911 adequate reception of MARPOL wastes without undue delay to ships.

912
 913 There are a number of potential waste management challenges under MARPOL for ships
 914 operating in Arctic regions which may include:

- 915
- 916 • Annex I oily waste: discharge prohibited (all) and must be retained on-board;
 - 917 • Annex II, Noxious liquid substances (NLS) or NLS mixtures: (all) must be
 918 retained on board;
 - 919 • Restrictions for discharges of sewage near land, fast ice, or ice shelf; and
 - 920 • Some or all Annex V wastes may need to be retained onboard. Additional
 921 restrictions exist for cargo residues and cargo hold wash water.

922
 923 Additional unique operational challenges for both ships and ports may include longer routes
 924 between ports, more days at sea due to weather delays, port closures, changing ice movements
 925 and local ice conditions. Logistics and costs to install and operate waste collection, storage,
 926 treatment and disposal equipment and technologies in remote Arctic areas are additional
 927 challenges, as is the potential need for ships to deviate from planned routes to make use of a
 928 specific port reception facility (PRF). All of this is compounded by the potential for too few
 929 ships calling at ports which may diminish economic viability and sustainability of individual
 930 facilities, but which also may create opportunities, regionally, for government and/or private
 931 sector support.

932
 933 A regional ship waste management strategy could include a regional reception facility plan
 934 which could take advantage of formal or informal agreements, including near-Arctic waters

935 facilities. Such near-Arctic ocean areas could include waters adjacent to both Arctic countries
936 and near-Arctic countries falling outside the Polar Code definition.

937
938 Benefits of a regional approach may include minimizing the risks associated with waste disposal
939 facilities which are located in remote regions or are only operational seasonally allowing for
940 sharing of waste management resources, infrastructure costs, and maintenance costs. They may
941 also be more attractive to investors as the potential financing partnerships would be regionally
942 based and, depending on the locations included in the agreements, include facilities that are
943 available year-round as well as seasonally, thus minimizing risks and maximizing potential users.

944

945 **Energy**

946

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

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

958 For example, the DOE Office of Energy Efficiency and Renewable Energy (EERE) recognizes
959 the critical role public-private partnerships play in accelerating the transition to a clean energy
960 economy.⁵⁷ The Small Business Vouchers (SBV) pilot program was launched in March 2016,
961 with an initial award to 33 small businesses. With 23 million small businesses currently
962 operating in the U.S., the pilot is heavily targeted in attracting companies that typically would
963 not have access to the scientific expertise and resources of the Department's national laboratories.
964 The SBV pilot makes it possible to direct the power of the national laboratories toward specific
965 problems identified by small businesses by pairing these companies with a national laboratory
966 uniquely qualified to solve their challenges.

⁵⁷ 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>.

967 SBV is a collaborative, national effort that provides \$20 million for U.S. companies to help
968 improve industry awareness of national laboratory capabilities and provide small and mid-size
969 businesses access to the resources available within the national laboratory system. These
970 collaborations focus on a number of areas, one of which is wind; two projects in the wind area
971 will develop methods for integrating wind power into existing power grids, in addition to
972 developing new methods of diagnosing damage to turbines.⁵⁸

973 DOE also published a report on Energy Investment Partnerships in December 2015.⁵⁹ This
974 document compiles examples of state and local government mechanisms in use creating P3s in
975 their community or region to support clean energy investment. By developing P3s and bringing
976 the appropriate mix of partners, authorities, and strategies to the table, each state, region,
977 municipality, and market can create a unique—but effective—vehicle to support clean energy
978 finance and deployment. The implementation of these entities, described as “Energy Investment
979 Partnerships (EIPs),” and sometimes referred to as “Green Banks,” is typically a result of
980 carefully structured public-private partnerships, cooperative political environments, legislative
981 mandates, and access to credit enhancement tools.

982 By leveraging private dollars, EIPs generate an impact well beyond what would be possible with
983 public funds alone. Programs across the country are showing how these lending programs can
984 leverage public dollars to increase investment in clean energy. Through issuing bonds,
985 authorities in Connecticut and New York have sold clean energy loan portfolios on the secondary
986 market. Florida’s nonprofit Solar and Energy Loan Fund (SELF) in St. Lucie County has
987 leveraged private dollars into clean energy loans for low and moderate income (LMI) individuals
988 by working with private banks’ Community Reinvestment Act (CRA) divisions and the
989 Community Development Finance Institution (CDFI). In 2015, the State of Rhode Island passed
990 legislation for the Rhode Island Infrastructure Bank, and Montgomery County, Maryland, also
991 passed legislation for a “Green Bank”—both entities are now moving forward in their
992 development.

993 The state of Alaska has the Alaska Energy Authority (AEA), an independent corporation
994 governed by a board of directors with the mission to “reduce the cost of energy in Alaska.”⁶⁰
995 Created by the Alaska Legislature in 1976, AEA is the state's energy office and lead agency for
996 statewide energy policy and program development. According to the AEA’s formative statute,
997 “The purpose of the authority is to promote, develop, and advance the general prosperity and
998 economic welfare of the people of the state by providing a means of financing and operating

⁵⁸ 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>.

⁵⁹ 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>.

⁶⁰ State of Alaska, Alaska Energy Authority. Available at: <http://www.akenergyauthority.org/>.

999 power projects and facilities that recover and use waste energy and by carrying out the powers
1000 and duties assigned to it under AS 42.45.” Alaska Stat. § 44.83.070 (2014).

1001 The AEA administers a number of programs and projects including the Emerging Energy
1002 Technology Fund supporting demonstration projects that develop and test new energy
1003 technologies, as well as old technologies that have yet to be implemented in Alaska.⁶¹ The
1004 Power Project Fund provides financing to smaller, local electric utilities for various projects,
1005 including waste-to-energy projects, energy conservation and energy efficiency projects, and
1006 alternative energy facilities and equipment.⁶²

1007
1008 Leveraging existing programs and finding ways to adapt them to the infrastructure needs of a
1009 port community may provide a first step toward ensuring the upland infrastructure exists to
1010 expand the maritime capabilities. Communities like Nome, which have started developing wind
1011 energy capabilities, face issues with finding a way to store excess wind energy generated, by no
1012 means a unique challenge. Creating the infrastructure and support for these kinds of investments in
1013 Nome and elsewhere also builds a foundation of best practices that can be shared and leveraged by
1014 other communities. Combining the benefits of grant and finance programs may provide more
1015 flexibility for small communities to increase their infrastructure stability and energy security and
1016 grow their maritime economies.

1017

1018 WATERWAYS MANAGEMENT

1019

1020 **Recommendation:** *Designate M-5 Alaska Marine Highway Connector to connect the Arctic Ocean and*
1021 *the western section of the Northwest Passage.*

1022 America’s Marine Highway System consists of over 25,000 nautical miles of navigable
1023 waterways including rivers, bays, channels, the Great Lakes, the Saint Lawrence Seaway
1024 System, coastal, and open-ocean routes. The Marine Highway Program works to further
1025 incorporate these waterways into the greater U.S. transportation system, especially where marine
1026 transportation services are the most efficient, effective, and sustainable transportation option. In
1027 the Arctic, marine transportation is one of the only options for moving goods over long
1028 distances; for large items or bulk goods that cannot travel by air, it is the only option.

1029 A designation of a Marine Highways Route is an acknowledgement by the Secretary of
1030 Transportation that it is part of the larger surface transportation system. It is important to
1031 identify operators who are eligible to apply for designation as a Marine Highway Project.

⁶¹ State of Alaska, Alaska Energy Authority. Available at: <http://www.akenergyauthority.org/About>.

⁶² State of Alaska, Alaska Energy Authority. Available at: <http://www.akenergyauthority.org/About>.

1032 Approved designations become eligible for Marine Highway Project Grants. The ports and cities
1033 along a route can work with shippers, vessel owners, and other public and private entities to
1034 develop projects for designation by the Secretary. These proposals can bring further focus to the
1035 regional efforts and entitles them to apply for grant funding, when appropriated. The industry
1036 plays the biggest role in the process. The public entities will be the sponsor of the project;
1037 however, private businesses are the key to making it work. The grants are to cover infrastructure
1038 deficits, but not operating subsidies, so the private partners and stakeholders have to provide the
1039 capital and the freight to make the project successful.

1040 Below are examples of designation as a Marine Highway Project:

- 1041 1. *Expanded container-on-barge operation in the Port of New York and New Jersey.*
1042 Designation is similar to a seal of approval for plans by Red Hook Container Terminal in
1043 partnership with the Port Newark Container Terminal to start offering eastbound service
1044 from New Jersey to Brooklyn and could be useful for seeking funding to expand or
1045 improve it in the future. The Port Authority applied for marine highway designation
1046 together with the New York City Economic Development Corporation. For 20 years, a
1047 westbound container-on-barge service has operated between the Red Hook Terminal in
1048 Brooklyn, New York and Port Newark, principally to bring cargo from the Brooklyn
1049 terminal to Newark and destinations west of the Hudson River. Barge service has proved
1050 to be valuable in moving cargo that lands in New York over to Newark on to its final
1051 destination, because historically a large amount of cargo has been destined west of the
1052 Hudson River. The new “New York Harbor Container and Trailer on Barge Service”
1053 will offer the carriers the ability to move cargo in the opposite direction from New Jersey
1054 to Brooklyn, and offer their customers a Brooklyn bill of lading. Port Authority and
1055 terminal operators work together to submit a Marine Highway Project Designation
1056 package.
- 1057 2. *Barge operator plans to develop container on barge service along the Mississippi and*
1058 *Illinois Rivers.* The M-55/M-35 Container on Barge Project of the Mississippi River
1059 Cities & Towns Initiative includes participation from mayors of 68 cities along the river.
1060 The Inland Rivers Ports & Terminals committed to working with the mayors in the
1061 initiative to revive container-on-barge shipping on the Mississippi River. The barge
1062 service will have a significant impact on the River region by providing jobs and
1063 improving transportation. It will position the region to be a global economic force,
1064 ensuring better use of river assets to increase the region’s economic health and
1065 competitiveness. The group has been working with shippers including Wal-Mart and
1066 Home Depot, the Illinois Soybean association and Ingram Barge to see what it would
1067 take to restore container movement to the waterway. Cities and operators work together
1068 to build a plan to submit for designation.

1069 MARAD, which manages the Marine Highway program, will work together with the State of
 1070 Alaska and tug and barge operators to identify those eligible to submit for Designation as a
 1071 Marine Highway Project. Those designated will be eligible to apply for Marine Highway Project
 1072 funding as it becomes available which can cover construction and could serve as the foundation
 1073 for further operate and maintain agreements in the form of P3.⁶³

1074

1075 **Charting and Observations**

1076 **Recommendation:** *Support and coordinate collection and sharing of observations and data for*
 1077 *waterways management and vessel routing requirements.*

1078 The Arctic remains an intensely harsh operating environment, and even as marine transportation-
 1079 dependent activities and development increase, so too do the significant risks of accident and
 1080 injury to people and fragile ecosystems in Alaska and the wider Arctic region. Therefore,
 1081 updated nautical charts, and observations for safe navigation are essential if the U.S. Arctic
 1082 Marine Transportation System (MTS) is to be capable of meeting the region's safety, security,
 1083 economic development, and environmental protection needs. There are six components that
 1084 underpin the delivery of essential navigation services to Arctic users: the foundational geodetic
 1085 and water levels infrastructure, hydrographic surveying, shoreline mapping, other ocean
 1086 observations that factor into decisional support and the nautical charts themselves. Each
 1087 component is interdependent upon the next in order for NOAA to deliver an integrated suite of
 1088 services to Arctic Alaskan residents, industries and mariners for safe navigation, as well as for
 1089 environmental protection. Accurate nautical charts will also facilitate any future designation of
 1090 subsistence use areas, marine protected areas, seasonal migration routes and other ecologically
 1091 relevant areas. Moreover, the data supports Arctic coastal community resilience, as it feeds into
 1092 storm surge models, erosion assessments and sea level change studies.

1093 Although over half of U.S. Arctic waters are classified as navigationally significant (242,000
 1094 square nautical miles), only about 6000 square nautical miles of this area (about 2 percent) has
 1095 been surveyed with modern multibeam technology. There are only 28 Continuously Operating
 1096 Reference Stations (CORS) Network sites along and north of the Aleutian Chain (as compared to
 1097 roughly 2000 in the Lower 48 states) and only ten National Water Level Observation Network
 1098 (NWLON) tidal stations with 20 additional gaps identified through analysis and stakeholder
 1099 engagement.

1100 NOAA contracts for some of its hydrographic and shoreline data acquisition, and for services to
 1101 install and maintain its NWLONs and CORS. NOAA also works collaboratively with partners to
 1102 leverage resources to acquire more data or test and develop solutions to Arctic equipment issues.

⁶³ 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>.

1103 Possible other partnership opportunities include cost-sharing for additional Arctic NWLON
1104 installation and maintenance. There is potential for collaboration and data sharing among private
1105 and public entities to fill in the data gaps on nautical charts following the Integrated Ocean and
1106 Coastal Mapping approach to “map once, use many times.” A survey company has indicated its
1107 support for collaborating on innovative hydrographic surveying to address the data and charting
1108 needs in the U.S. Arctic. NOAA’s Policy on Partnerships in the Provision of Environmental
1109 Information” (NAO 216-112) recognizes the significant information produced by the commercial
1110 and academic sectors and supports and the benefits of these products. NOAA’s Big Data Project
1111 is facilitated through a series of CRADAs with Amazon Web Services, Google Cloud Platform,
1112 IBM, Microsoft Corp., and the Open Cloud Consortium explores ways to share environmental
1113 data on cloud-based platforms.

1114

1115 **Satellite AIS Capabilities**

1116 **Recommendation:** *Expand partnerships to provide new satellite AIS capabilities for offshore*
1117 *activity information.*

1118 The Marine Exchange of Alaska (MXAK) provides critical route planning support to mitigate
1119 risk. They have self-supported AIS sites located throughout the state. MXAK is a non-profit
1120 maritime organization established to serve the Alaska maritime community by providing
1121 information, communications, and services to ensure safe, secure, efficient, and environmentally
1122 responsible maritime operations. There are 95 land-based AIS receiving stations operated by the
1123 Marine Exchange of Alaska; 13 are north of the Bering Strait. The MXAK uses this AIS data for
1124 domain awareness, risk mitigation, and navigation planning to support the regional maritime
1125 community.

1126 Currently, USCG has a cooperative agreement with the non-profit Marine Exchange of Alaska
1127 (MXAK) to obtain AIS positional information from their shore-based receivers. Because the
1128 network is owned and operated by MXAK, the USCG is a consumer of the output of that service.
1129 It may be possible to augment the current system to track vessels operating further offshore
1130 through partnering with an additional service offered by the MXAK as well as other potential
1131 providers in the area. Through identifying unique information gaps and technology solutions, it
1132 may be possible to create partnerships that can leverage both private and public investment.

1133

1134 **EMERGENCY RESPONSE**

1135 **Aviation**

1136 **Recommendation:** *Continue collaboration with State and local authorities to ensure readiness*
1137 *of Arctic maritime and aviation infrastructure for emergency response and SAR.*

1138 Aviation is a vital component of Alaska's transportation system. Whether one lives in Anchorage
1139 or the smallest community at the tip of the Aleutians, air service is the lifeline that connects all
1140 Alaskans to other communities in the state, to the Lower 48, and to the world. Alaska's airports
1141 serve the transportation needs of the state's residents, support the movement of materials and
1142 goods, contribute substantially to the economy, and enable delivery of critical medical services.
1143 Nearly 82% of Alaska communities are not accessible by road, making aviation more than a
1144 convenience or a luxury - aviation is essential in the Alaskan way of life. Alaska has six times as
1145 many pilots per capita and 16 times as many aircraft per capita when compared to the rest of the
1146 United States and the Alaska Department of Transportation & Public Facilities owns 247 rural
1147 airports all key assets for connecting communities and resources in the state.⁶⁴

1148 Airports are also key connectors for responding to emergency situations. It is over 1000 miles
1149 by vessel to travel from Kodiak, AK to Barrow, at the top of Alaska and would take a number of
1150 days to complete the transit. It takes the U.S. Coast Guard approximately 6 hours to fly from
1151 Anchorage on a direct flight to Barrow in the event of an emergency. The reliance on aviation
1152 infrastructure to move supplies and people for response services highlights the need for reliable
1153 infrastructure to enable these critical response capabilities.

1154 An airport Master Plan or Airport Layout Plan update is the primary means by which airport
1155 sponsors and the FAA evaluate the current and future needs at an airport. The projects identified
1156 through the planning process vary widely. Examples include infrastructure improvements to
1157 meet airport design standards, shore protection from erosion, apron/lease lot development and
1158 occasionally runway relocations due to damage caused by significant coastal erosion/storm
1159 surges. Funding comes from either federal or non- federal sources depending on the type of
1160 work involved. The FAA works with these airports in the development of a capital improvement
1161 plan that addresses and prioritizes airport development needs for the overall aviation system
1162 within the State of Alaska. Some of the factors the FAA considers when prioritizing projects for
1163 AIP grant funding include: eligibility, justification, national priority ranking, cost, and ability to
1164 deliver the project (meeting environmental and design requirements).

1165 The Barrow airport master plan update is one example where security and emergency response
1166 was a consideration. The United States Coast Guard (USCG) had requested to place assets at
1167 the airport in response to increased oil and gas exploration and increased marine traffic in the
1168 area. This prompted the airport to identify an area on the airport for a future USCG hangar and
1169 ramp space to support future search and rescue efforts in the area.

1170 Special grant assurances that apply to an airport owner make P3 difficult to implement. There
1171 would need to be a review of the proposed P3 project with respect to ensuring the airport owner
1172 can continue to satisfy these grant assurances. All project costs (and assigned funding) would

⁶⁴ State of Alaska, Alaska Department of Transportation & Public Facilities, Division of Statewide Aviation.
Available at: <http://dot.alaska.gov/stwdav/index.shtml>.

1173 need to be clearly delineated; this ensures that Airport Improvement Program (AIP) funding is
1174 utilized strictly for items that it is authorized for, and it allows for the FAA to ensure usable
1175 development is being built in accordance with applicable standards at a reasonable cost.

1176 Although there have not been any P3 airport projects in Alaska, there have been some limited
1177 examples of other federal and non- federal agencies financially participating in the development
1178 of an airport project. The high cost of the Akutan airport project, at approximately \$77M,
1179 prompted the State of Alaska Department of Transportation, the Aleutians East Borough and the
1180 City of Akutan to enter into a project co-sponsorship and collectively obtain other non-FAA
1181 funds for the project. They were successful in securing additional funds from Federal Highways
1182 Administration, City of Akutan, the U.S. Economic Development Administration, Trident
1183 Seafoods, the East Aleutians Borough and the State of Alaska to close the funding gap for the
1184 project.

1185 One option to help support aviation infrastructure could be the Federal Aviation Administration
1186 (FAA) Airport Privatization Pilot Program. This program was created by Congress and began in
1187 September 1997 to explore privatization as a means of generating access to various sources of
1188 private capital for airport improvement and development. Private companies may own, manage,
1189 lease and develop public airports. The 2012 Reauthorization Act increased the number of airports
1190 than can participate from five to 10. The Act authorized FAA to permit up to 10 public airport
1191 sponsors to sell or lease an airport with certain restrictions and to exempt the sponsor from
1192 certain Federal requirements that could otherwise make privatization impractical.⁶⁵

1193 It may be beneficial to review Alaska airport locations that would be considered critical
1194 infrastructure nodes during an emergency response situation and explore the possibility of using
1195 the FAA program or similar to ensure that airport infrastructure is sufficient to support a large
1196 scale response.

1197 Additional benefits of these kinds of investments could include auxiliary benefits to the
1198 communities serviced by those regional or local airports through increases in flight and goods
1199 movement capacities. Given the limited options for shipping goods in Alaska, enhancing the
1200 underlying support infrastructure could produce benefits for several sectors.

1201

1202 **Technology Development**

1203 There are potential opportunities for research and development (RD) cooperative projects which
1204 could leverage both the needs of the Government and communities with the talents and funding
1205 of private industry. For example, the Anchorage-based Alaska Maritime Prevention and

⁶⁵ Department of Transportation, Federal Aviation Administration, Airport Privatization Pilot Program. Washington, 2014. Available at: http://www.faa.gov/airports/airport_compliance/privatization/.

1206 Response Network, a non-profit organization, is collaborating with several companies to develop
1207 a prototype ship arrestor - essentially a massive, underwater parachute, designed to slow or stop
1208 a large ship if an incident causes it to start drifting.⁶⁶ In this case, the technology may not be
1209 something vessels keep aboard, but rather a tool that can be stationed as part of a response
1210 network in the region, within communities including at ports and other locations that would
1211 facilitate its deployment. The system could then be delivered to a vessel in distress by either
1212 another vessel or by aircraft in instances when a tugboat isn't available to help. While not a
1213 traditional P3, the development of these kinds of technologies, which can ultimately be marketed
1214 back to governments and the private sector, provide an opportunity for the return on the
1215 investment needed to get critical technology to market. There may be additional opportunities
1216 where known technology gaps can be leveraged through investment partnerships that are then
1217 able to market the resulting products.

1218 Both the U.S. and USCG Arctic Strategies stress the important role that public-private
1219 partnerships will play in developing the critical infrastructure needed for effective, efficient, and
1220 safe operations in this emerging remote and hostile environment. To that end, the Coast Guard
1221 Research and Development Center (RDC) has entered into a Cooperative Research and
1222 Development Agreement (CRADA) with the Marine Exchange Alaska (MXAK) to promote a
1223 public-private analysis and potential options for a Next Generation Arctic Navigational Safety
1224 Information System.

1225 The mission need is reliable critical navigational safety information to identify, assess, and
1226 mitigate navigational risks in the Arctic region. The RDC's objective is to define, develop,
1227 demonstrate, and evaluate, in an operational setting, at least one promising technology approach
1228 to the "Next Generation Arctic Maritime Navigational Safety Information System." The goal is
1229 to provide time-critical information to mariners so that they may better assess and manage their
1230 voyage risks as they transit the U.S. Arctic Exclusive Economic Zone (EEZ).

1231 Via a 5 five-year CRADA, the RDC and MXAK will collaborate to design, develop, test, and
1232 evaluate, within the U.S. Arctic EEZ waters, at least one technology approach to the "Next
1233 Generation Arctic Maritime Navigational Safety Information System." This "Technology
1234 Demonstration (Tech Demo)" is anticipated to be conducted over several Arctic shipping
1235 seasons. The RDC will document the results of this prototype system(s) so that the insights
1236 gained can be incorporated into future maritime safety systems, which conform to future USCG
1237 and IMO policies and requirements, whether they be owned/operated by private or government
1238 entities.

1239

⁶⁶ 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/>.

1240 **Oil Spill Response Capability**

1241 **Recommendation:** *Develop on-shore facilities for oil spill response (e.g. hazardous/oily waste*
 1242 *disposal, wildlife response, responder housing).*

1243 The Alaska Regional Response Team guides the contingency planning efforts for the Federal and
 1244 State response to oil spills, in partnership with maritime industry and local stakeholders. The
 1245 logistics required to move response equipment and personnel is a challenge in the Arctic region.
 1246 Industry has a major responsibility in the staging and moving of equipment to respond to oil
 1247 spills. P3s can play a role during the identification of capability gaps in local response planning
 1248 and addressing potential mechanisms to close those gaps to strengthen capability.

1249 The oil and gas industry, shipping companies, mining and fishing enterprises, adventure tour
 1250 operators, and others seeking gains in the Arctic serve critical roles, especially with respect to
 1251 pollution prevention and response. The “polluter pays” principle is a motivating factor and
 1252 corresponding requirement for all operators, to do all possible to prevent harm and everything
 1253 necessary to lessen their environmental impact. The Coast Guard, Department of Homeland
 1254 Security, Department of the Interior, Environmental Protection Agency, National Oceanographic
 1255 and Atmospheric Administration, Department of Transportation, Department of Defense, and
 1256 other government representatives must work together with industry and others in the private
 1257 sector to identify and implement best practices to prevent and respond to challenges in the
 1258 region. This effort may require innovate funding schemes to ensure appropriate Federal
 1259 presence.⁶⁷

1260

1261 Arctic Oil Spill Response Research (OSRR) projects are examples of how the Bureau of Safety
 1262 and Environmental Enforcement (BSEE) has and continues to address the ongoing operational
 1263 and environmental concerns associated with energy exploration and exploitation in the Arctic.
 1264 OSRR projects are advancing collective knowledge of oil spill response capabilities in cold
 1265 water environments, and are important to ensure that the U.S. is prepared for an oil spill response
 1266 in the harsh Arctic environment. Examples of the funded projects range from oil skimmer
 1267 technologies that recover spilled oil to polymer technology to absorb the oil and provide storage
 1268 options.

1269 Programs like this build the base for technology development and demonstration, which could
 1270 take the form of P3 or similar financing arrangements. Continued collaboration with State and
 1271 industry stakeholders to identify highest priority locations for oil spill preparedness
 1272 growth/development is key to making sure the equipment currently existing, or
 1273 underdevelopment, is distributed in the most effective manner and paired with the communities
 1274 most able to respond in the event of an incident.

⁶⁷ U.S. Coast Guard, *Arctic Strategy*, Washington, 2013. Available at:
https://www.uscg.mil/seniorleadership/DOCS/CG_Arctic_Strategy.pdf.

1275 **Search and Rescue**

1276 No single agency or nation has the sovereignty, capacity, or control over resources necessary to
1277 meet all emerging challenges in the Arctic. A strong network of partnerships is required to
1278 deliver the platforms, people, and protocols necessary to secure the region against transnational
1279 threats, facilitate legitimate commerce, and protect the environment. The U.S. Coast Guard will
1280 seek out new areas of mutual interest to build strategic partnerships which promote innovative
1281 and affordable solutions, and enhance burden-sharing throughout the region. These efforts must
1282 be collaborative with the private sector and international partners to amplify capabilities,
1283 enhance operational effectiveness, and establish a balanced and capable future force construct.
1284

1285 In August 2012, AIDEA was approved to construct, own, and operate a facility, an expansion of
1286 the existing National Guard Armory, for use by the U.S. Coast Guard (USCG) on Joint Base
1287 Elmendorf and Richardson (JBER). Specifications for the Camp Denali Readiness Center
1288 Addition Project (CDRCAP) were presented to AIDEA in a USCG document entitled, “USCG
1289 Sector Anchorage Facility Requirements”, in June 2011. Using funds provided via a
1290 Reimbursement Services Agreement to AIDEA from the Department of Military and Veteran’s
1291 Affairs (DMVA), AIDEA retained a consultant to advance these specifications to a design
1292 level.⁶⁸

1293 Through the Project Development and Operations Agreement, the DMVA is responsible for
1294 payments to AIDEA, subject to future legislative appropriations. In a separate agreement
1295 between the DMVA and the USCG, DMVA will be responsible for the operations and
1296 maintenance of the facility and the USCG will pay the DMVA directly for this effort.

1297 This project was paid for with funds from AIDEA’s Economic Development Fund. The
1298 Memorandum of Agreement (MOA) between the USCG and the DMVA provides a payment of
1299 \$1.1 million annually to AIDEA. This building is leased for 30 years from AIDEA to the
1300 DMVA who subleases the building to the USCG.

1301 This project fulfills AIDEA’s mission of economic development and job growth by creating up
1302 to 80 new jobs during the facility construction, retaining over 115 USCG and civilian jobs in the
1303 Anchorage area and adding other jobs through consolidation of USCG billets from around the
1304 state to the new facility. Housing the USCG at the Camp Denali Readiness Center facility will
1305 enhance the cooperative efforts serving Alaska by strengthening interagency relations between
1306 the Department of Defense, the State of Alaska and the USCG. Due to the location of the
1307 Readiness Center addition, it will also facilitate synergy between the USCG and the Army/Air
1308 Guard through shared training classrooms and the medical clinic.
1309

⁶⁸ 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

1310
1311
1312

1313 Innovative financing can encompass all aspects of the infrastructure investment process, from the
1314 predevelopment/seed-money phase, to consideration of non-traditional forms of P3s, as well as
1315 hybrid financing approaches that allocate demand risk between the public and private partners.
1316

1317 Predevelopment or Project Preparation

1318

1319 Predevelopment includes such activities as project planning, feasibility studies, cost-benefit
1320 analyses, design and engineering, financial planning (including the identification of funding and
1321 financing options), permitting, an assessment of community and environmental impacts, and
1322 public outreach and community engagement.⁶⁹ Although only accounting for a small percentage
1323 of overall project costs, the predevelopment phase largely defines how projects will be paid for
1324 and built, and is the point in the investment process at which some of the most critical best
1325 practices are implemented. Predevelopment analysis is particularly essential for P3s, both to
1326 assess whether P3 funding can save money for taxpayers over the project lifecycle compared to
1327 conventional procurement, and because the quality of project preparation can have a
1328 considerable effect on a P3's long-run financial viability.

1329

1330 As an example of one approach to predevelopment, Canada established a Project Development
1331 Fund (PDF) in 2013 through its centralized public-private partnership unit, PPP Canada. The
1332 PDF supports inexperienced jurisdictions with the affordability of the upfront development work
1333 required in order to properly determine which procurement option is best suited to their project –
1334 conventional or P3. Applicants are eligible for up to 50% cost sharing to receive reimbursement
1335 to assist them in undertaking and completing necessary predevelopment work, including
1336 identification of risks and optimal risk sharing strategies.⁷⁰

1337

1338 The United States does not have a centralized public-private partnership unit at the national level
1339 (though such units exist in several states); nor does it have a centralized project development
1340 fund to support predevelopment work. At the Infrastructure Summit hosted by the Department
1341 of the Treasury and Department of Transportation in 2014, two philanthropic organizations, the

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 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>.

1342 Ford Foundation and Rockefeller Foundation, announced they would provide an initial joint
 1343 investment of over \$1 million to support the launch of a predevelopment fund for cutting-edge
 1344 projects, and to provide seed capital for regional collaboration models such as regional
 1345 infrastructure exchanges.⁷¹ Consideration might be given to setting up an Arctic-region
 1346 infrastructure exchange.

1347
 1348 Despite initial efforts of philanthropic organizations, the major challenge remains: Project
 1349 sponsors undertaking innovative infrastructure projects – whether innovative in terms of using
 1350 emerging technologies or P3 financing – lack sufficient funding for the early phases of
 1351 infrastructure project development that precede actual construction. The Build America
 1352 Recommendations Report sent to the President in January 2015 concluded that State and local
 1353 government project sponsors need expanded access to predevelopment funding for infrastructure
 1354 projects, and recommended identifying opportunities for connecting state and local-based
 1355 projects with complementary Federal predevelopment resources. The report also advised that
 1356 predevelopment opportunities within Federal programs should be explored, and that a better
 1357 understanding of the role that the private sector could play in supporting P3 project
 1358 predevelopment was necessary.⁷²

1359
 1360 Based on these recommendations, the President issued a memorandum in January 2015
 1361 instructing relevant agencies to issue guidance on their development-related grant programs and
 1362 ordering a coordinated outreach and technical assistance campaign to educate state and local
 1363 governments on the benefits of predevelopment funding for non-Federal P3 projects. In May, the
 1364 White House, Ford Foundation and the Rockefeller Foundation jointly hosted a Roundtable with
 1365 leading thinkers on infrastructure planning and design on how to plan and design infrastructure
 1366 to foster economic opportunity and increase resilience to climate change.⁷³ An output of the
 1367 roundtable was publication of the Federal Resource Guide for Infrastructure Planning and

⁷¹ 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.)

⁷² 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>.

⁷³ 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>.

1368 Design.⁷⁴ The Guide describes the role of predevelopment in the infrastructure investment
 1369 process, lays out guiding principles, and presents case studies on how the Federal government
 1370 has partnered with state and local governments on predevelopment activities. Importantly, the
 1371 Guide provides an extensive list of Federal agency resources that support predevelopment
 1372 through funding and technical assistance.

1373
 1374 The Guide is an extremely valuable resource that can be utilized for Federal P3s for Arctic
 1375 infrastructure projects, and may help projects maximize the benefits that can be obtained from
 1376 available resources (e.g. it indicates if one Federal resource can be used as a match for other
 1377 Federal funds); in addition, the Guide may foster efficient coordination across infrastructure
 1378 sectors.⁷⁵ The report also describes which types of predevelopment assistance can be applied to
 1379 state and local governments, Indian Tribes, private sector entities, non-profits, or communities,
 1380 providing roadmap for projects with multiple stakeholders.

1381
 1382

1383 **Non-traditional P3s**

1384
 1385 Non-traditional P3s and certain complementary programs can potentially play a role in Arctic
 1386 infrastructure investment as well, particularly in the area of broadband infrastructure.

1387
 1388 For instance, as reviewed in the Information Infrastructure section above, in 2011, the Federal
 1389 Communications Commission (FCC) created the Connect America Fund (CAF), designed to
 1390 connect all Americans to high-speed Internet, wherever they live.⁷⁶ CAF provides support to
 1391 certain qualifying telephone companies that serve high-cost, primarily rural areas, ensuring that
 1392 the residents of these regions have access to reasonably comparable service at rates reasonably
 1393 comparable to urban areas. Working through a non-profit corporation that it created for this
 1394 purpose, the FCC makes payments to telephone companies operating in high cost areas that
 1395 enable them to cover the difference between what customers are able to pay for service and their
 1396 costs. The subsidy payment can be thought of as being analogous to an availability payment
 1397 because it includes specific service requirements and accountability that needs to be maintained
 1398 in order to receive the funding. Although the assets remain privately held, they have a duty to
 1399 provide a specified level of service in order to receive the public funds through the program.

⁷⁴ 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>.

⁷⁵ (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.)

⁷⁶ 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>.

1400
1401 This type of model could potentially be applied in the Arctic region, and possibly even for other
1402 types of infrastructure assets beyond telecommunications. However, the FCC recognized that
1403 private firms might not have an incentive to operate as cost efficiently as possible if they know
1404 they are going to receive a subsidy. Therefore, the agency developed a methodology to compare
1405 the costs of firms applying for the subsidy payment to the average cost of “similarly situated”
1406 firms, in order to avoid overpaying. If this type of model were to be considered for Arctic region
1407 projects, it would be incumbent upon project sponsors to determine if the data and analytics were
1408 available to establish similar safeguards and best practices.

1409
1410 Two complementary programs merit some discussion even though they are not P3s themselves,
1411 because of their potential to help steer financial resources to P3s. These programs are designed
1412 to encourage financial institutions to channel their resources to underserved, low income, or non-
1413 metropolitan communities in order to help improve the economic resilience and incomes of these
1414 communities. Recently, under the impetus of the Broadband Opportunity Council (BOC), these
1415 programs were modified to explicitly encourage investment in broadband infrastructure.
1416 Application to coastal communities in the Arctic would likely bring direct benefits to these areas
1417 and indirect spillover benefits to offshore assets utilizing this enabling technology.

1418
1419 The first program is the New Markets Tax Credit Program (NMTC), which is in fact currently
1420 utilized by AIEDA. The NMTC Program attracts private capital into low-income communities
1421 by permitting individual and corporate investors to receive a tax credit against their Federal
1422 income tax in exchange for making equity investments in specialized financial intermediaries
1423 called Community Development Entities (CDEs). The credit totals 39 percent of the original
1424 investment amount and is claimed over a period of seven years. With these capital investments,
1425 CDEs can make loans and investments to businesses operating in distressed areas. In connection
1426 with the work of the Broadband Opportunity Council, the Community Development Financial
1427 Institutions fund (CDFI), which is part of the U.S. Department of the Treasury and which
1428 administers the NMTC program, recently clarified that loans and investments made by CDEs to
1429 support broadband infrastructure are eligible for NMTC investments, provided they meet certain
1430 IRS Regulations related to a business qualifying under the NMTC program. This program
1431 guidance is now available to the public on the CDFI Fund’s website with all of the NMTC
1432 Allocation Application materials.⁷⁷

1433
1434 The second program falls under the Community Reinvestment Act of 1977 (CRA) and is
1435 administered by the Office of the Comptroller of the Currency (OCC, an independent bureau of
1436 the U.S. Department of the Treasury) and other U.S. bank regulatory agencies. The CRA

⁷⁷ 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>.

1437 provides a framework for financial institutions, state and local governments, and community
1438 organizations to jointly promote banking services to all members of a community. The Act
1439 encourages efforts to meet the credit needs of all community members, including residents of
1440 low- and moderate-income neighborhoods. Under the Act, financial institutions are evaluated by
1441 the OCC and other regulators on how effective they have been in helping to revitalize or stabilize
1442 underserved nonmetropolitan geographies. In connection with the work of the Broadband
1443 Opportunity Council, the OCC recently included broadband investment as one of the factors it
1444 will consider when evaluating whether a financial institution has been effective in meeting
1445 essential community needs, thus providing an incentive for banks to make investments in this
1446 area.⁷⁸

1447
1448 Application of the Connect America Fund – that can improve the affordability of and demand for
1449 broadband in distressed areas, along with changes to the NMTC program and eligible CRA
1450 projects may lead to increased investment in broadband infrastructure in the Arctic region.
1451 Under these programs, financial institutions would have increased incentives to lend to or invest
1452 in P3s that are involved with building or rehabilitating communications infrastructure. It is
1453 important to keep in mind that broadband is an enabling infrastructure that can support many
1454 different applications and services, both public and private, from telemedicine and distance
1455 learning, to supporting search and rescue operations. The construction, operations and
1456 maintenance, and financing costs of new or rehabilitated broadband networks and services in
1457 Arctic coastal communities could potentially be shared by direct payments from local
1458 residential/business customers, Federal subsidy-availability payments, as well as payments from
1459 by maritime assets (vessels and oil rigs) that would benefit from having access to this enabling
1460 technology. The details of compensation mechanisms are very important because they affect
1461 how demand risk is allocated between the public and private partners, and therefore the
1462 willingness of the partners to participate in a project.

1463

1464 Risk Sharing

1465
1466 Private investors and public sponsors may have different tolerances for accepting demand risk.
1467 As a result, allocating all of the demand risk to one party or the other can be an impediment to
1468 moving forward on a P3 transaction, if, for example, neither the public nor private partner is
1469 willing to assume *all* of the risk. For instance, a project may not proceed if it relies exclusively
1470 on user fees that shift all demand risk to the private sector, or on availability payments that

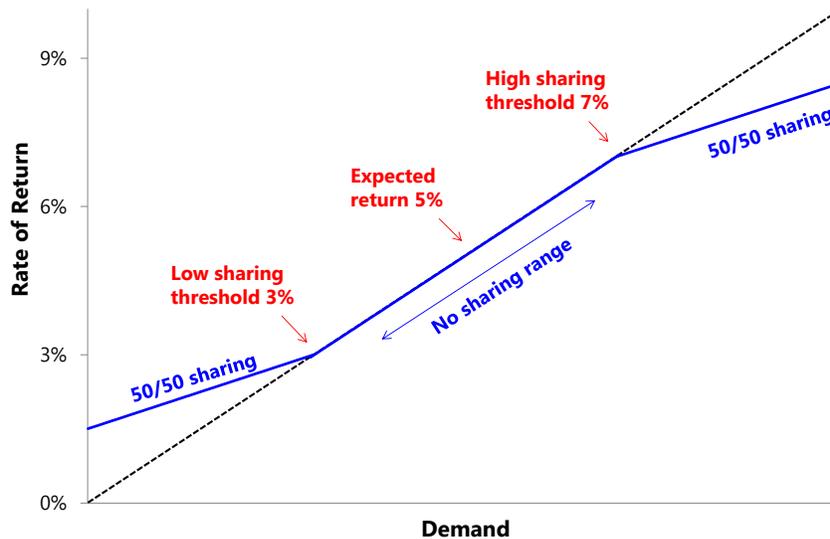
⁷⁸ U.S. Department of the Treasury, Office of the Comptroller of the Currency, Community Reinvestment Act; Interagency Questions and Answers Regarding Community Reinvestment Guidance, 81 Fed. Reg. 48506. Washington, 2016. Available at: <https://www.gpo.gov/fdsys/pkg/FR-2016-07-25/pdf/2016-16693.pdf>. (The other bank regulators are the Federal Reserve System and Federal Deposit Insurance Corporation.)

1471 allocate all the risk to the public sector. In contrast to the basic user fee and availability
 1472 payments models, alternative P3 incentive structures can potentially align public and private
 1473 sector interests in infrastructure provision and management by having both partners share in the
 1474 project’s downside risk as well as the upside potential. In other words, a middle ground is
 1475 possible if the private investor is willing to relinquish part of the project’s upside potential in
 1476 exchange for getting some downside protection.⁷⁹

1477
 1478 Risk or profit-sharing arrangements can vary from project to project, and should be worked out
 1479 during the project’s predevelopment phase and contract negotiations between the partners. The
 1480 key point is that flexibility can expand the universe of acceptable deals because investors may be
 1481 more willing to enter into an agreement when both sides have skin in the game. This type of risk
 1482 sharing flexibility would seem to be particularly well suited for an enabling technology like
 1483 broadband that can support a mix of applications and services across a diverse customer base.

1484
 1485 While specific contract terms and conditions will vary according to each transaction, the chart
 1486 below illustrates a stylized framework that reflects the main principles of this approach.

1487
 1488



1489
 1490
 1491
 1492 The level of demand is measured on the “x-axis” and the return on private investment on the “y-
 1493 axis”. The dashed black line represents a pure user fee model in which the rate of return varies
 1494 proportionately with demand. The user fee approach puts all demand risk on the private investor

⁷⁹ 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>.

1495 because it bears the full brunt of any shortfall in demand below expectations. In this example,
1496 the expected level of demand gives rise to an expected return of 5 percent.

1497
1498 Instead of a user fee model, consider a contract where the private partner retains all profits within
1499 the 3 to 7 percent rate of return range (“No sharing range”) but the government sponsor shares
1500 50-50 in any return shortfall below 3 percent or any returns in excess of 7 percent. The solid
1501 blue lines represent the private sector return above and below the negotiated return thresholds of
1502 3 and 7 percent, respectively. If demand falls into the low range, the private firm will absorb just
1503 half of the shortfall between the 3 percent threshold and the actual rate of return (on the dashed
1504 black line), experiencing the return illustrated by the solid blue line. To make up the shortfall,
1505 the public sponsor may pay a subsidy to the private partner analogous to an availability payment.
1506 If demand reaches the high range, the private firm will share half of the return above 7 percent
1507 with the project sponsor.⁸⁰

1508
1509 While the quantitative details of specific transactions may vary, the basic principle is the same;
1510 this approach can be implemented by incorporating key characteristics of the contract into the
1511 competitive bidding process widely used to award P3 contracts. For example, the public
1512 sponsor, possibly with the assistance of outside financial experts, could define the structure of
1513 the desired contract, and private firms vying for the project would bid on the specific contractual
1514 elements, such as their preferred sharing percentages or rate of return thresholds. The public
1515 sponsor would evaluate the bids, selecting the bidder most likely to deliver the project at the
1516 lowest lifecycle cost while meeting quality standards, maximizing value for taxpayers.⁸¹

1517
1518

1519

⁸⁰ 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>. (Depending on the contract details, different metrics could be used on the “y-axis”, such as the dollar amount of profit or revenue.)

⁸¹ 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>.

1520

CHAPTER VI: RECOMMENDATIONS AND CONCLUSIONS

1521

1522 Recommendations

1523 The recommendations in this section are listed in the order in which they generally appear in the
1524 text. They are not ranked in any particular order and serve to reinforce, not only the individual
1525 recommendations, but the overarching recommendation that P3s are a powerful tool with many
1526 opportunities for application in the Arctic. Application of traditional and non-traditional P3
1527 arrangements could serve as a significant source of funding for Arctic maritime transportation
1528 needs as well as community and economic development needs. As mentioned in the text, strict
1529 interpretations of financial and financing arrangements are not always appropriate, particularly
1530 for a region as unique as the Arctic. The following recommendations should be used to help
1531 guide the planning process for Federal departments and agencies as well as for communities and
1532 industry who are interested in exploring the possibilities P3 may offer for their infrastructure
1533 priorities.

- 1534 1. Federal agencies should work closely with State, Local and Tribal governments and the
1535 private sector to ensure policies maximize overall investment in and adoption of services
- 1536 2. Flexibility in determining the national economic benefits of development in Alaska, one
1537 of the barriers to any successful P3, may provide an avenue to pursue non-traditional
1538 financing and investment arrangements, previously unavailable in the region.
- 1539 3. Explore whether land use rights and/or land ownership can be leveraged for infrastructure
1540 development (e.g. publicly owned land leased and used for private development) as part
1541 of a P3 arrangement.
- 1542 4. There are a variety of potential options and ingenuity for financing, land acquisition, and
1543 economic justification that should be explored to the fullest extent possible to identify
1544 any collaborative opportunity where P3 or non-traditional financing could be applicable
1545 to development of port infrastructure.
- 1546 5. A regional ship waste management strategy could include a regional reception facility
1547 plan which could take advantage of formal or informal agreements, including near-Arctic
1548 waters facilities. The benefits of which may include minimizing the risks associated with
1549 waste disposal facilities located in remote regions or only seasonally operational and
1550 sharing of waste management resources, infrastructure costs, and maintenance costs.
- 1551 6. Explore potential financing partnerships that would be regionally based and, depending
1552 on the locations included in the agreements, include facilities that are available year-
1553 round as well as seasonally, thus minimizing risks and maximizing potential users.
- 1554 7. Leverage existing programs and find ways to adapt them to the infrastructure needs of
1555 Arctic communities may provide a first step toward ensuring infrastructure exists to
1556 expand the maritime capabilities.

- 1557 8. Combine the benefits of grant and finance programs to provide more flexibility for small
1558 communities to increase their infrastructure stability and energy security and grow their
1559 maritime economies.
- 1560 9. Work to identify private partners and stakeholders who can provide the capital and the
1561 freight to submit for Marine Highway Project funding to cover infrastructure deficits.
- 1562 10. Review Alaska airport locations that would be considered critical infrastructure nodes
1563 during an emergency response situation and explore the possibility of using the FAA
1564 Airport Privatization Pilot Program or similar to ensure that airport infrastructure is
1565 sufficient to support a large scale response.
- 1566 11. Identify opportunities for research and development (RD) cooperative projects which
1567 could leverage both the needs of the Government and communities with the talents and
1568 funding of private industry. Identify opportunities where known technology gaps can be
1569 leveraged through investment partnerships that are then able to market the resulting
1570 products back to governments and the private sector potentially providing an opportunity
1571 for the return on the investment needed to get critical technology to market.
- 1572 12. Utilize programs like Arctic Oil Spill Response Research (OSRR) to build the base for
1573 technology development, demonstration, and staging/deployment which could take the
1574 form of P3 or similar financing arrangements.
- 1575 13. Support the use and expansion of predevelopment fund for cutting-edge projects to
1576 provide seed capital for regional collaboration models such as regional infrastructure
1577 exchanges and set up an Arctic-region infrastructure exchange.
- 1578 14. Expand access to predevelopment funding for infrastructure projects, and identify
1579 opportunities for connecting state and local-based projects with complementary Federal
1580 predevelopment resources.
- 1581 15. Explore non-traditional P3 structures such as subsidy payments, analogous to an
1582 availability payment, which includes specific service requirements and accountability that
1583 need to be maintained in order to receive the funding. This would include developing a
1584 methodology to compare the costs of firms applying for the subsidy payments to the
1585 average cost of “similarly situated” firms.
- 1586 16. Identify and explore programs that are designed to encourage financial institutions to
1587 channel their resources to underserved, low income, or non-metropolitan communities in
1588 order to help improve the economic resilience and incomes of these communities. Under
1589 these programs, financial institutions would have increased incentives to lend to or invest
1590 in P3s that are involved with building or rehabilitating communications infrastructure.
- 1591 17. Identify projects and partnerships where the construction, operations and maintenance,
1592 and financing costs of new or rehabilitated infrastructure and services in Arctic coastal
1593 communities could potentially be shared by direct payments from local
1594 residential/business customers, Federal subsidy-availability payments, as well as
1595 payments from by maritime assets (vessels and oil rigs) that would benefit from having
1596 access to the asset.

1597 18. Identify alternative P3 incentive structures that can potentially align public and private
1598 sector interests in infrastructure provision and management by having both partners share
1599 in the project’s downside risk as well as the upside potential.
1600

1601 **Conclusions**

1602 Infrastructure investment is vital for economic growth and prosperity in the Arctic, especially
1603 given the significant infrastructure gaps currently faced. Public-private partnerships represent a
1604 promising approach that can leverage the strengths of the private and public sectors to expand
1605 and improve Arctic infrastructure. In each case, the public authority must establish that a P3
1606 would provide net benefits that go beyond what is attainable through conventional procurement.
1607 Successful P3 implementation requires executing a set of additional best practices before the
1608 project gets underway. Failing to follow due diligence methodology could lead to higher costs,
1609 failure to meet performance targets later in the life cycle, and a misallocation of public resources.

1610 To that end, there are opportunities to use and adapt P3 to the U.S. Arctic. Through Federal
1611 agencies coordination with State, Local and Tribal governments and the private sector policies
1612 can be created to maximize overall investment in and adoption of services. These kinds of
1613 relationships and collaboration can also provide flexibility in determining the national economic
1614 benefits of development in Alaska which may provide an avenue to pursue non-traditional
1615 financing and investment arrangements. Working with private industry and investors to use
1616 existing guidelines like the Federal Resource Guide for Infrastructure Planning and Design may
1617 help and identify opportunities for connecting state and local-based projects with complementary
1618 Federal resources including predevelopment sources.

1619 The Exploration of non-traditional P3 structures such as subsidy payments and aligning public
1620 and private sector interests in infrastructure provision and management and risk allocation can
1621 provide powerful tools and opportunities unavailable through traditional procurement
1622 arrangements.

1623 At its heart, a P3 furnishes alternative financing mechanisms which can be leveraged through
1624 targeted collaborations to achieve successful delivery of critical Arctic infrastructure. P3 are a
1625 powerful financing mechanism and should be considered as a valuable option for delivering the
1626 infrastructure necessary to ensure safe, secure, and environmentally sustainable maritime
1627 transportation in the U.S. Arctic.

1628

1629

1630

1631

1632 **Annex I – Review of previous deliverables**

1633

1634 **Overview of NSAR Task 1.1.1: 10-Year Projection of Maritime Activity in the U.S. Arctic**

1635 Submitted to the National Security Council on January 16, 2015, the 10-year Projection Study of
1636 Maritime Activity in the U.S. Arctic completed an assigned action under the National Strategy
1637 for the Arctic Region Implementation Plan (NSAR IP). This report provides estimates on vessel
1638 traffic in the U.S. Arctic (numbers of vessels and transits) based on modeling of current baseline
1639 traffic data and growth potential as defined by various progression scenarios. It is the first step
1640 toward developing a framework to guide Federal activities related to the construction,
1641 maintenance, and improvement of ports and other infrastructure needed to preserve the mobility
1642 and safe navigation of U.S. military and civilian vessels throughout the U.S. Arctic region.

1643 The vessel activity projections are separated into three general categories of growth from which
1644 scenarios were explored. These categories are (1) estimated growth in global trade; (2)
1645 assumptions regarding the diversion of international vessel traffic from the Suez and Panama
1646 Canals in favor of Arctic shipping routes; and (3) various oil and gas exploration and production
1647 scenarios for the next decade. The scenarios span a range (i.e. low, medium, and high) of
1648 intentionally conservative assumptions to less conservative development patterns with higher
1649 rates of vessel diversion enabled by increased accessibility to the Arctic. A conservative estimate
1650 of the number of unique vessels operating in the Bering Strait and U.S. Arctic in 2025 is 420,
1651 resulting in approximately 877 transits through the Bering Strait, or a doubling over 2013 transit
1652 levels. These conservative estimates assume no increase in oil and gas activity over 2011 levels.
1653 The transit statistics from 2015 support the general projections in the report and showed an
1654 increase of 50 unique vessels over the 2012 numbers. The various growth possibilities developed
1655 by the projections helped to inform the range of infrastructure needs evaluated in subsequent
1656 reports.

1657

1658

1659 **Overview of NSAR Task 1.1.2: Ten-Year Prioritization of Infrastructure Needs in the U.S.** 1660 **Arctic**

1661 The CMTS report, "A Ten-Year Prioritization of Infrastructure Needs in the U.S. Arctic,"
1662 presents a framework to address Arctic infrastructure gaps. It identifies critical requirements for
1663 a safe and secure U.S. Arctic Marine Transportation System (MTS) to be implemented over the
1664 next decade. There are 43 recommendations covering five core MTS components (waterways
1665 management, physical infrastructure, information infrastructure, response services, and vessel
1666 operations). These components, if integrated over time, support the establishment of a stronger,
1667 more resilient U.S. Arctic MTS.

1668 The report also completes the second milestone of the National Strategy for the Arctic Region
 1669 (NSAR) 2014 Implementation Plan, which is intended to guide Federal activities related to the
 1670 construction, maintenance, and improvement of marine transportation Arctic infrastructure.

1671 The recommendations set forth for consideration in this report are grouped into three categories
 1672 under each of the five primary components: (1) infrastructure considerations that require both
 1673 near-term planning and near-term implementation; (2) infrastructure considerations requiring
 1674 near-term planning for mid- to long-term implementation; and (3) infrastructure considerations
 1675 requiring long-term planning and implementation. This categorization facilitates the discussion
 1676 of many coordinated infrastructure needs while acknowledging planning and funding
 1677 requirements and limitations.

1678 The ordering of infrastructure in this report is not intended to create a hierarchy of most to least
 1679 important, but rather to demonstrate the necessary sequence to create the strongest foundation for
 1680 U.S. Arctic infrastructure supporting current and future needs. By categorizing based on near-,
 1681 mid-, and long-term needs, we can recognize interdependencies (e.g., to have accurate charts, we
 1682 must first have good geodetic control and tidal data, along with accurate shoreline mapping and
 1683 hydrographic survey data), and breakdown critical infrastructure projects into their basic
 1684 interrelated components. These components, if properly integrated over time, support the
 1685 establishment of a stronger, more resilient U.S. Arctic MTS

Near-Term Recommendations	
Navigable Waterways	Designate Port Clarence as an Arctic Maritime Place of Refuge.
	Review Port Clarence facilities to assess whether adequate support facilities are available at Port Clarence or in the region for a ship in need of assistance.
	Support Arctic Waterways Safety Committee efforts to bring stakeholders together
	Leverage existing data-sharing frameworks, such as Data.gov, the Alaska Regional Response Team, and Alaska Ocean Observing System, to facilitate waterways planning and response to environmental emergencies.
	Leverage international partnerships supporting waterways coordination.
	Work with stakeholders to coordinate research efforts to de-conflict research within commercial and subsistence use areas.
	Designate M-5 Alaska Marine Highway Connector to connect the Arctic Ocean and the western section of the Northwest Passage.
Physical Infrastructure	Prioritize the need for Arctic port reception facilities to support international regulatory needs and future growth.
	Expand Arctic coastal and river water-level observations to support flood and storm-surge warnings.
	Review U.S. Arctic maritime commercial activities to identifying major infrastructure gaps that should be addressed to promote safe and sustainable Arctic communities.

	<p>Co-locate new Continuously Operating Reference Stations and National Water Level Observation Network stations to significantly improve the Arctic geospatial framework with precise positioning and water levels.</p>
<p>Information Infrastructure</p>	<p>Improve weather, water, and climate predictions to an equivalent level of service as is provided to the rest of the nation.</p>
	<p>Implement short-range, sea-ice forecasting capability.</p>
	<p>Place hydrography and charting of the U.S. maritime Arctic among the highest priority requirements for agency execution.</p>
	<p>Advance Arctic communication networks to ensure vessel safety.</p>
	<p>Finalize the Port Access Route Study for the Bering Strait and continue efforts to provide routes for vessel traffic in the U.S. Arctic.</p>
	<p>Expand partnerships to provide new satellite Automatic Identification System (AIS) capabilities for offshore activity information.</p>
<p>MTS Response Services</p>	<p>Continue collaboration with State and local authorities to ensure readiness of Arctic maritime and aviation infrastructure for emergency response and Search and Rescue (SAR).</p>
	<p>Continue coordination through international fora to provide significant opportunities for engagement across the Federal Government and the international Arctic response community.</p>
	<p>Support Pan-Arctic response equipment database development, best practices recommendations, and information sharing for continued development of guidelines for oil spill response in the Arctic.</p>
	<p>Develop a plan to transport critical response equipment from the contiguous U.S. into the Arctic area in the event of a catastrophic event.</p>
	<p>Evaluate facilities currently available on the North Slope for use as seasonal staging areas by those engaged in readiness exercises or research.</p>
<p>Vessel Operations</p>	<p>Expand U.S. icebreaking capacity to adequately meet mission demands in the high latitudes.</p>
	<p>Update domestic law to implement the mandatory provisions of the Polar Code and the Convention on Standards of Training, Certification and Watchkeeping for Seafarers.</p>
	<p>Examine existing training and safety standards applicable to the U.S. fishing fleet with respect to the new Polar Code requirements.</p>